

In the United States Court of Federal Claims

No. 04-37C

(Filed: May 19, 2008)

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CAROLINA POWER & LIGHT COMPANY, and *
FLORIDA POWER CORPORATION, *
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Plaintiffs, *
*
v. *
*
THE UNITED STATES, *
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Defendant. *
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Spent Nuclear Fuel Case; Nuclear Waste Policy Act of 1982; Interpretation of DOE's Standard Contract; Recovery of Mitigation Damages for DOE's Partial Breach of Contract.

Brad Fagg, with whom were *Paul M. Bessette*, and *David M. Kerr*, Morgan Lewis & Bockius, LLP, Washington, D.C., for Plaintiffs.

Andrew P. Averbach, with whom were *Jeffrey S. Bucholtz*, Acting Assistant Attorney General, *Jeanne E. Davidson*, Director, and *Harold D. Lester, Jr.*, Assistant Director, United States Department of Justice, Civil Division, Commercial Litigation Branch, Washington, D.C., *Jane K. Taylor*, *Marian E. Sullivan*, *Christopher J. Carney*, *Lisa L. Donahue*, and *Stephen Finn*, Of Counsel, for Defendant.

OPINION AND ORDER

WHEELER, Judge.¹

Plaintiffs Carolina Power & Light Company (“CP&L”) and Florida Power Corporation (“FPC”) claim damages of \$91,029,704 from Defendant caused by the failure of the Department of Energy (“DOE”) to collect and dispose of spent nuclear fuel beginning January 31, 1998 under the terms of DOE’s Standard Contract. CP&L and FPC are wholly-

¹ This case was transferred to Judge Thomas C. Wheeler on December 5, 2005, pursuant to Rule 40.1(b) of the Rules of the Court of Federal Claims.

owned subsidiaries of Progress Energy, Inc., a public utility in the southeast United States. Plaintiffs' damages consist of costs incurred in mitigation of DOE's partial breach of the Standard Contract. This Court has jurisdiction over Plaintiffs' claim pursuant to the Tucker Act, 28 U.S.C. § 1491(a). See PSEG Nuclear, LLC v. United States, 465 F.3d 1343 (Fed. Cir. 2006). Defendant's liability for partial breach of contract has been established. See Maine Yankee Atomic Power Co. v. United States, 225 F.3d 1336, 1337-40 (Fed. Cir. 2000) ("Maine Yankee"); N. States Power Co. v. United States, 224 F.3d 1361, 1367 (Fed. Cir. 2000). Thus, only damages are at issue.

CP&L and FPC (collectively "Progress Energy" or "Plaintiffs") operate five nuclear reactors at four power plants in North Carolina, South Carolina, and Florida. The power plants are known as Harris, Brunswick, Robinson, and Crystal River. Plaintiffs' damages claims fall into five categories: (1) \$208,120 to complete a study for a dry storage facility known as an Independent Spent Fuel Storage Installation ("ISFSI") at the Brunswick plant; (2) \$32,734,951 to activate two additional spent fuel storage pools at the Harris plant; (3) \$16,975,182 to ship spent fuel from the Robinson and Brunswick plants to the Harris plant; (4) \$36,436,059 to construct and load the Robinson plant ISFSI; and (5) \$4,675,392 to design, construct, and replace spent fuel racks at the Crystal River Plant.

The United States Court of Appeals for the Federal Circuit has held that nuclear utilities may recover proven incurred costs as mitigation damages for DOE's partial breach, but may not recover forecasted future costs. Indiana Michigan Power Co. v. United States, 422 F.3d 1369, 1375-77 (Fed. Cir. 2005) ("Indiana Michigan"). Consequently, Plaintiffs have limited their claims in this case to costs incurred through December 31, 2005. In accord with the Restatement (Second) of Judgments § 26 (1982), Plaintiffs retain the right to bring later actions on claims for damages incurred thereafter. See Indiana Michigan, 422 F.3d at 1378.

Defendant opposes Plaintiffs' claims in part, but acknowledges that Plaintiffs at a minimum are entitled to recover \$44,339,037. Defendant accepts responsibility for an additional \$16,962,904, increasing the total to \$61,301,941, if the Court agrees with Plaintiffs' view of DOE's obligations under the Standard Contract. Defendant's objections to Plaintiffs' damages generally are that: (1) Plaintiffs have not properly credited DOE for costs they would have incurred absent the breach; (2) Plaintiffs have not shown that certain costs increased incrementally as a result of the breach; and (3) certain costs were not caused by the breach, or are otherwise unsupported or unallowable. Defendant agrees that Plaintiffs' claimed costs were foreseeable at the time of contracting, and that the incurred costs were reasonable.

The Court conducted a nine-day trial in Washington, D.C. during November 5-16, 2007. The witnesses in order of appearance were: Lou Martin, former manager of nuclear fuel at Progress Energy; Steve Edwards, supervisor of Progress Energy's Spent Fuel Management Unit; Robert Kunita, former CP&L senior engineer; Alva Wayne Worthington, Progress Energy's lead engineer of the Spent Fuel Management Unit; Michael Culver, a Progress Energy reactor engineer; Dean Tibbitts, a Progress Energy engineer; Tom Lehmann, former FPC nuclear chemistry manager; Ted Williams, superintendent of major projects at Progress Energy; Tom Pollog, a DOE engineer in the Office of Waste Management within DOE's Office of Civilian Radioactive Waste Management ("OCRWM"); Robert Morgan, DOE's former director of OCRWM; David Zabransky, a nuclear utility specialist in the OCRWM's Office of Waste Management; Mike Calvello, manager of Nuclear Generation Business Services at Progress Energy; Defendant's experts, Gregory Maret and Larry Johnson; and Michael Lawrence, DOE's former director of the OCRWM.

The Court also accepted the parties' designations of previous deposition and trial testimony from eight witnesses who were unable to testify at trial: Lake H. Barrett, DOE's former deputy director of the OCRWM; Alan Brownstein, DOE's former director of the OCRWM Regulatory Coordination Division; Christopher Kouts, DOE's former director of the OCRWM Office of Waste Management; Loring E. Mills, former executive with the Edison Electric Institute ("EEI"); Ronald Milner, former chief operating officer of the OCRWM; Robert M. Rosselli, former director of DOE's Resource Management Division; Nancy H. Slater, former team leader in the OCRWM Regulatory Coordination Division; and Victor W. Trebules, former director of the Office of Project Control at OCRWM. The parties filed post-trial briefs on January 22, 2008, and reply briefs on February 19, 2008. The Court heard closing arguments on April 4, 2008.

For the reasons explained below, the Court finds that Plaintiffs are entitled to recover \$82,845,926 in mitigation damages through December 31, 2005. The Court agrees in large part with Plaintiffs' interpretation of DOE's Standard Contract. In furtherance of the purposes of the Nuclear Waste Policy Act of 1982, 42 U.S.C. §§ 10101-10270 (1982), the intent of the Standard Contract was for DOE to begin collecting and disposing of spent nuclear fuel beginning January 31, 1998, and to do so in sufficient quantities so that nuclear utilities would not need to provide any additional storage facilities at individual reactor locations. DOE contemplated the establishment of two central repositories, and an interim storage facility if needed, where the spent fuel would be stored. One of these repositories was to be located at Yucca Mountain, Nevada. As events unfolded, the central repositories were not established, and DOE did not collect or dispose of any spent fuel beginning January 31, 1998. To date, DOE has yet to collect and dispose of any spent fuel, even as nuclear plant owners have been paying billions of dollars in fees to DOE under the Standard Contract. Plaintiffs alone have paid DOE \$661 million in fees through December 31, 2005.

The Court has disallowed four elements of Plaintiffs' damages claim. For two such items, the Crystal River re-rack project (\$4,675,392) and the Harris component cooling water system upgrade (\$1,166,640), the Court concludes that Plaintiffs would have incurred these expenses for other reasons absent DOE's partial breach. For various manual journal entries challenged by Defendant (\$345,701), Plaintiffs have not met their burden of showing what these expenses were for, or whether they were caused by DOE's breach. Plaintiffs' claim for Allowance for Funds Used During Construction ("AFUDC") (\$1,996,045) is in reality a claim for interest against the Government, and is unallowable by law. See 28 U.S.C. § 2516(a). Deduction of these disallowed items from Plaintiffs' total claim, \$91,029,704, yields a recovery to Plaintiffs of \$82,845,926.

Findings of Fact²

A. Progress Energy's Nuclear Power Plants

In December 2000, CP&L merged with FPC and became known as Progress Energy. (Edwards, Tr. 223).³ One effect of this merger was to place all of the nuclear plants of CP&L and FPC into one organization. Id. CP&L is the majority owner of the Harris and Brunswick plants, and the full owner of the Robinson plant. (Stip. 5). FPC is the majority owner of the Crystal River plant. (Stip. 6). For convenience, the Court will refer to "Progress Energy" in describing events that apply both to CP&L and FPC.

Harris is a single unit pressurized water reactor ("PWR") located near New Hill, North Carolina, southwest of Raleigh. (Stip. 24). The Harris plant began commercial operation in 1987 and currently is licensed to operate through 2026. (Stip. 25). In 2006,

² This statement of facts constitutes the Court's principal findings of fact under Rule 52(a) of the Court. Other findings of fact and rulings on mixed questions of fact and law are set forth in the later analysis.

³ 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 expert witnesses presented their expert analyses through demonstrative exhibits, which the Court will refer to as "PX-D__" for Plaintiffs, and "DX-D__" for Defendant. The parties' joint pretrial stipulations of fact, filed on October 19, 2007, are referred to as "Stip. __." The Court will refer to the testimony of the eight witnesses who were unable to attend the trial as "Name, Case Name, Tr. __," or if the previous testimony was by deposition as "Name, Date Dep., Tr. __." For lengthy exhibits, citations include a page number where available, or otherwise a reference to the last four digits of Bates numbers.

Progress Energy submitted an application to the Nuclear Regulatory Commission (“NRC”) to renew the Harris operating license for an additional 20 years. (Stip. 26).

Brunswick is a two unit boiling water reactor (“BWR”) located near Southport, North Carolina, on the Atlantic Coast south of Wilmington. (Stip. 48). Brunswick Units 1 and 2 began commercial operations in 1977 and 1975, and are licensed to operate through 2036 and 2034 respectively. (Stip. 49).

Robinson is a single unit PWR located near Hartsville, South Carolina. (Stip. 34). Robinson began commercial operation in 1971 and is licensed to operate through 2030. (Stip. 35).

Crystal River is a single unit PWR located near Crystal River, Florida, on the Gulf Coast north of Tampa. (Stip. 19). The Crystal River plant began commercial operation in 1977 and currently is licensed to operate through 2016. (Stip. 20). Progress Energy plans to submit an application to the NRC in September 2008 to renew the Crystal River operating license for an additional 20 years. (Edwards, Tr. 232, 235).

B. The Nuclear Waste Policy Act

In 1977, President Carter announced that reprocessing of spent nuclear fuel and the development of advanced plutonium-based reactors in the United States would be deferred indefinitely. See H.R. Rep. No. 97-491(I), at 27 (1982), reprinted in 1982 U.S.C.C.A.N. 3792, 3794. President Carter adopted this policy to curb the potential for proliferation of nuclear weapons arising from an expanded plutonium-based nuclear economy. Id. The new policy caused a spent fuel bottleneck in the United States. Domestic nuclear reactors had not been designed with lifetime spent fuel storage capacity, and no near-term destination for spent fuel existed. H.R. Rep. No. 97-491(I), at 28; (Martin, Tr. 73, 80).

On January 7, 1983, Congress passed the Nuclear Waste Policy Act of 1982 (“NWPA”), Pub. L. 97-425, 96 Stat. 2201, codified at 42 U.S.C. §§ 10101-10270 (1982). In adopting the NWPA, Congress recognized that “radioactive waste creates potential risks and requires safe and environmentally acceptable methods of disposal,” and that “a national problem has been created by the accumulation of [spent nuclear fuel].” 42 U.S.C. § 10131(a)(1)-(2). Congress also found that:

[W]hile the Federal Government has the responsibility to provide for the permanent disposal of high-level radioactive waste and such spent nuclear fuel as may be disposed of in order to protect the public health and safety and the environment, the costs of such

disposal should be the responsibility of the generators and owners of such waste and spent fuel.

§ 10131(a)(4). The NWPA further provided that the generators and owners of spent fuel had the responsibility to provide for, and pay the cost of, interim storage of spent fuel “until such waste and spent fuel is accepted by the Secretary of Energy in accordance with the provisions of this Act.” § 10131(a)(5).

In pursuit of the NWPA’s objectives, Congress directed the Secretary of DOE 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 waste or spent nuclear fuel.” § 10222(a)(1). Congress required the contracts to provide that:

(A) following commencement of operation of a repository, the Secretary shall take title to the high-level radioactive waste or spent nuclear fuel involved *as expeditiously as practicable* upon the request of the generator or owner of such waste or spent fuel; and

(B) in return for the payment of fees established by this section, the Secretary *beginning not later than January 31, 1998*, will dispose of the high-level radioactive waste or spent nuclear fuel involved as provided in this subtitle.

§ 10222(a)(5) (emphasis added). Congress mandated that the utilities’ fees be sufficient to support the costs of the Government’s spent fuel disposal efforts. § 10222(a)(2)-(3).

C. The Standard Contract

On February 4, 1983, DOE published in the Federal Register the proposed terms for the “Standard Contract for Disposal of Spent Nuclear Fuel and/or High Level Radioactive Waste” (the “Standard Contract”). 48 Fed. Reg. 5458 (Feb. 4, 1983); (Stip. 8). DOE received many comments to the proposed Standard Contract from utilities and industry representatives, including CP&L and FPC. (Stip. 10; Martin, Tr. 136-40; PX 6). Nuclear plant owners and operators were required to enter into DOE’s Standard Contract as a condition to obtaining renewal of their operating licenses. Indiana Michigan, 422 F.2d at 1372 (citing 42 U.S.C. § 10222(a)(1); Maine Yankee, 225 F.3d at 1337); (Morgan, Tr. 1419-20). Consequently, the Standard Contract was not the product of any negotiation. (Lawrence, Tr. 2135). Utilities effectively had no choice but to sign the Standard Contract, or risk having the NRC shut down their nuclear power plants. (Morgan, Tr. 1419-20).

DOE issued the Standard Contract as a final rule on April 18, 1983. 48 Fed. Reg. 16590 (Apr. 18, 1983); (Stip. 11). CP&L executed the Standard Contract on June 3, 1983, and FPC executed the Standard Contract on June 30, 1983. (PX 10, 11). CP&L's contract covered the spent fuel generated at the Brunswick, Harris, and Robinson plants. (Stip. 12). FPC's contract covered the spent fuel generated at the Crystal River plant. Id. The provisions of the CP&L and FPC Standard Contracts were identical. (PX 10, 11).⁴

Consistent with the intent of the NWPA, the Standard Contract required DOE to "accept title to all SNF . . . provide subsequent transportation for such material to the DOE facility, and dispose of such material in accordance with the terms of this contract." (PX 10, Article IV, B, "DOE Responsibilities"). DOE was required to begin performance "after commencement of facility operations, not later than January 31, 1998 and shall continue until such time as all SNF . . . has been disposed of." (PX 10, Article II, "Scope"). The Standard Contract required DOE to issue an annual capacity report ("ACR") every year, beginning no later than July 1, 1987, to project DOE's annual spent fuel receiving capacity for the ten years "following the projected commencement of operation of the initial DOE facility." (PX 10, Article IV, B, 5(b)). DOE was required to issue an annual acceptance priority ranking ("APR") beginning April 1, 1991 to identify the order in which spent fuel and other high level waste would be collected, with the general rule being that the oldest fuel or waste would be picked up first. (PX 10, Article IV, B, 5(a)). After DOE issued an APR, the Standard Contract required each utility to submit a delivery commitment schedule ("DCS") to DOE identifying the spent fuel that the utility "wishe[d]" to deliver to DOE beginning sixty-three months thereafter. (PX 10, Article V, B, "Delivery Commitment Schedule"). DOE would approve or disapprove the DCS within three months of receipt. Id. If DOE disapproved a DCS, it would advise the utility of the reasons for disapproval, and the utility would have 30 days to submit a "revised schedule." Id. Utilities had the right to adjust the quantities of spent fuel up or down by 20 percent, and, subject to DOE's approval, to exchange an approved DCS with other utilities higher up the APR list. Id.

The Standard Contracts required utilities to pay certain fees to DOE. (PX 10, Article VIII, "Fees and Terms of Payment"). CP&L and FPC agreed to pay a one-time fee to cover spent fuel discharged through April 1983. Id. CP&L, for example, made a \$100 million dollar payment to DOE in 1983. (Martin, Tr. 79). The Standard Contract also required the payment of quarterly fees after April 1983. Through December 31, 2005, Progress Energy, CP&L, and FPC have paid approximately \$661 million in fees to DOE for the disposal of spent fuel under Plaintiffs' Standard Contracts. (Stip. 16).

⁴ In describing the Standard Contract, the Court will refer to CP&L's contract (PX 10), although the terms of the FPC contract (PX 11) are the same. The terms and provisions of the Standard Contract also are available at 10 C.F.R. § 961.11 (1983).

D. The Acceptance Rate

The Standard Contract did not contain a specific acceptance rate, but instead established a process by which DOE would identify and collect quantities of spent fuel from the utilities. (PX 10, Articles IV-VII). Although lacking a specific rate, the Standard Contract required DOE to take title to, transport, and dispose of all spent nuclear fuel or high-level radioactive waste “as expeditiously as practicable,” commencing not later than January 31, 1998. (PX 10 at 1, 6, 9). Progress Energy’s manager of nuclear fuel understood these terms to mean that, after January 31, 1998, utilities would not have to provide any additional storage at their nuclear reactors. (Martin, Tr. 84-85; PX 35 at 8). His expectation was that the Standard Contract, once DOE began performance in 1998, would “solve [Progress Energy’s] spent fuel storage problems.” (Martin, Tr. 80).

This understanding of DOE’s obligation was based on both the provisions of the Standard Contract, and DOE’s contemporaneous written and oral communications. For example, DOE assumed in a June 1983 report on financing the disposal of spent fuel that its acceptance rate for the nuclear industry would be 1,800 metric tons of uranium (“MTUs”) per year for the first five years, and 3,000 MTUs per year thereafter. (PX 8 at 9). DOE confirmed the five-year ramp up to a permanent 3,000 MTU acceptance rate in its February 1985 “Nuclear Waste Fund Fee Adequacy: An Assessment.” (PX 27 at 3). According to Mr. Martin, the nuclear industry was discharging approximately 2,000 MTUs per year during the mid-1980s. Consequently, DOE’s planned 3,000 MTU per year acceptance rate “would be consistent with DOE’s taking fuel on a schedule that did not require [Progress Energy] to be adding . . . storage capacity.” (Martin, Tr. 108).

In December 1983, Robert Morgan, DOE’s Acting Director of OCRWM, advised the nuclear industry that:

Technically, the Act does not specify how much waste or spent fuel we must begin receiving [on January 31, 1998]. In fact, if we accepted one spent fuel element in 1998 we would technically be in accordance with the Act. However, we did not believe that that meets the intent of the Act. The basic strategy which we’ve outlined in the mission plan, is that beginning in 1998, utilities will not have to provide any additional storage facilities on site. During the first year of operation of the repository in 1998, we should be receiving fuel at a rate so that no utility would have to add any further storage facilities either on site or at another location.

(PX 19 at 11). Two months later, Michael Lawrence, DOE's next Acting Director of OCRWM, testified to Congress that the "fundamental objective" of the NWPA was "to accept high-level radioactive waste for safe management, storage and permanent disposal on a firm schedule, beginning not later than January 31, 1998." (PX 21 at 2). Mr. Lawrence further explained that "[b]y achieving this fundamental objective and implementing an appropriate waste acceptance schedule, this will initially preclude the need for additional at-reactor storage by nuclear utilities after January 31, 1998, and, ultimately, remove all eligible waste from at-reactor storage." Id.

Progress Energy also based its understanding of DOE's acceptance rate obligation on statements made in DOE's draft mission plans and its June 1985 final mission plan. The NWPA required DOE to prepare the mission plan to provide an "informational basis sufficient to permit informed decisions to be made in carrying out the repository program . . ." 42 U.S.C. § 10221(a). Congress required the mission plan to include, among other things, an estimate of the "total repository capacity required to safely accommodate the disposal of all high-level radioactive waste and spent nuclear fuel expected to be generated through December 31, 2020," the number and type of repositories required to provide such disposal, and the acceptance schedule for each repository. § 10221(a)(9).

The December 20, 1983 draft mission plan, which DOE circulated to Congress and the utilities, stated that the "waste acceptance schedule will, initially, preclude the need for additional at-reactor storage after January 31, 1998 and, ultimately, remove from at-reactor storage all waste that is more than 5-years old." (PX 17 at 1078). In this draft mission plan, at "Table II-1: Waste Acceptance Schedule," DOE projected two repositories. The first repository would accept spent fuel at a rate of 1,800 MTUs for the first five years, and 3,000 MTUs thereafter. DOE projected that after five years, a second repository with identical acceptance rates would become operational. This plan meant that in 2003, the sixth year of the program, DOE would accept 4,800 MTUs from the nuclear industry, 3,000 MTUs in the first repository and 1,800 MTUs in the second. DOE estimated that only 2,718 MTUs of spent fuel would be generated in the nuclear industry in 2003. The remainder of the 4,800 MTU acceptance capacity in 2003 would be applied toward reducing the backlog of older fuel. Id. at 1082.

According to the 1983 draft mission plan, DOE recognized the possibility that the 1,800 MTU acceptance rate during the first five years would not cover the total spent fuel generated for each individual utility. Id. at 1081-82. DOE planned, however, that if a utility encountered such a problem, it could "arrange for the right to ship spent fuel to the Department from a utility who is next in queue in shipment allocation . . ." Id. at 1081-83. The draft mission plan also stated that DOE did "not intend to delay or postpone the acceptance of civilian radioactive wastes even if a permanent geologic repository is not

completed by 1998.” Id. at 1080. DOE planned to avoid any untimely performance through use of a Federal Interim Storage or Monitored Retrievable Storage (“MRS”). (PX 17 at 1080; Lawrence, Tr. 2086-87). DOE planned for the MRS, if necessary, to receive spent fuel at the same rate that DOE was planning for the permanent repository. (Lawrence, Tr. 2151; PX 31 at 126; PX 36 at 20).

DOE published the final version of the mission plan in June 1985. (PX 31). The mission plan adopted as the “authorized system” a phased repository acceptance schedule with the first repository receiving 3,000 MTUs per year after a five-year ramp up period. Id. at 26. The mission plan’s acceptance rates were based in part on attempting to keep pace with spent fuel discharges and alleviating the need for additional storage at nuclear reactors. (Pollog, Tr. 1231-32). The mission plan also outlined an “Improved Performance System,” illustrating the possibility of incorporating an MRS into the program. (PX 31 at 27). DOE described the expected role of an MRS in the Federal Waste Management Program:

The MRS facility would allow the DOE to accept spent fuel without interruption even if the repository is delayed or its emplacement operations are reduced. The MRS facility would safely store spent fuel until the repository was capable of receiving and emplacing it. Moreover, waste-acceptance activities would not be affected by temporary slowdowns or other operational problems that could be experienced at the repository. Consequently, a firm schedule for spent-fuel acceptance could be established to accommodate the DOE’s contractual commitments to the utilities paying fees into the Nuclear Waste Fund.

Id. at 73. The waste acceptance schedule for the Improved Performance System provided for the MRS to accept spent fuel prior to 1998 and to achieve a steady rate of 3,000 MTUs per year starting in 1998. Id. at 27. According to DOE, this proposed schedule would “provide assurance that the DOE’s acceptance of spent fuel in 1998 and subsequent years will be at sufficient rates to meet obligations.” Id. at 87.

DOE’s internal correspondence also is relevant in assessing the agency’s understanding. In a July 23, 1984 letter, Mr. Lawrence, then manager of DOE’s Richland, Washington Operations Office, observed:

It should be noted that to eliminate the need for additional at-reactor storage after January 31, 1998, the initial waste acceptance rate for 1998 should be about 2,800 MTU plus some amount up to 630

MTU, depending upon the extent Federal Interim Storage is utilized.

(PX 26 at 1199). In attached comments to his letter, Mr. Lawrence stated:

Based upon our interpretation of the NWPA, the minimum acceptance rate should be based upon the rate at which spent fuel is generated by civilian nuclear power reactors. This would be consistent with the NWPA intent that no power reactor would require additional spent fuel storage after January 31, 1998.

Id. at 1201. Mr. Lawrence confirmed at trial that these statements reflected his interpretation of the NWPA. (Lawrence, Tr. 2174).

A September 15, 1983 DOE memorandum similarly states that “the central criteria for this schedule is an acceptance rate during the first 5 years such that no utility would have to build additional storage facilities after 1998.” (PX 15 at 1046).

Lake Barrett, another of DOE’s deputy directors of OCRWM, testified in a deposition that in 1986, DOE was designing a system to receive 3,000 MTUs a year. He stated “[m]y recollection is that the MRS was to receive 3,000 tons a year circa that time prior to the amendments act, which was in excess of the generation rate of around 2,000.” (Barrett, Apr. 22, 2002 Dep., Tr. 51-52). Mr. Barrett explained that accepting fuel in excess of the generation rate was “significant” because DOE had to “design a system to remove the backlog of materials that were accumulating under the intent of the act.” Id. at 52. Mr. Barrett confirmed that the 3,000 MTU per year rate was consistent with the intent of the NWPA to reduce the backlog of spent fuel throughout the nation in a reasonable period of time. Id. at 59; (see also Barrett, May 10, 2002 Dep., Tr. 1163-66).

Based upon DOE’s assertions and its own understanding, CP&L’s 1986 Spent Fuel Management Plan reported that “DOE is currently planning to remove from utility storage all spent fuel on a schedule that will preclude utilities from having to provide any additional storage capacity at nuclear power plant sites after January 31, 1998.” (PX 35 at 8).

E. DOE’s Partial Breach

By 1987, DOE knew that it would not have a functioning permanent repository to begin accepting spent fuel on January 31, 1998. DOE estimated that a permanent repository would be delayed at least five years, until 2003. (DX 59 at 6). On March 31, 1987, DOE submitted a proposal to Congress for construction of an MRS facility in Tennessee capable

of “[f]ull-scale operation at a rate of about 2500 to 3000 MTU per year.” (PX 36 at 20; DX 59 at 11). Mr. Lawrence testified that, at the time of contract formation in 1983, there was no reason for the MRS acceptance rate to differ from the permanent repository acceptance rate. (Lawrence, Tr. 2151). DOE planned to use the MRS facility to act “as a system buffer that would allow continued waste acceptance regardless of changes in the schedule of waste emplacement for the first several years of operation at the first repository.” (DX 59 at 11). Expecting a five-year delay in the permanent repository, DOE requested Congress to limit the storage capacity for the MRS to 15,000 MTUs and it designed the MRS facility to have a 3,000 MTU acceptance rate capacity. (Kouts, Pac. Gas, Tr. 2775-76; Milner, May 3, 2002 Dep., Tr. 555-56; PX 36 at 20; DX 59 at 5, 11).

In 1987, Congress amended the NWPA and authorized DOE to construct an MRS facility. See Nuclear Waste Policy Amendments Act of 1987, Pub. L. No. 100-203, §§ 5001-5065, 101 Stat. 1330, 1330-227 to 1330-255 (1987) (codified in scattered sections of Title 42). Recognizing the potential for the MRS to become the de facto repository, Congress set two conditions for the start of MRS operations: (1) construction could not begin until a license was issued for the construction of a permanent repository; and (2) storage capacity at the MRS could not exceed 10,000 MTUs. 42 U.S.C. § 10168(d)(1), (3). In June 1987, DOE published its first statutorily required ACR, noting that it was “for planning purposes only, and, thus, is not contractually binding on either DOE or the Purchasers.” (PX 38 at 2). The 1987 ACR adopted the acceptance rate schedule of the 1987 Mission Plan Amendment: 1,200 MTUs annually during 1998-2002, 2,000 MTUs in 2003, and 2,650 MTUs annually thereafter. (PX 38 at 7).

By November 1989, DOE projected a “significant slip for the expected start of repository operations – from the year 2003 to approximately 2010.” (DX 71 at vii). In April 1991, DOE published its first official APR setting the order of fuel acceptance based on the “oldest fuel first.” (Pollag, Tr. 1312, 1321-22; DX 99). DOE also published the 1991 ACR with acceptance rates based on three key assumptions: only an MRS facility would be operable, the MRS would have a 10,000 MTU capacity, and Congress would amend the NWPA to remove the condition that construction of the MRS could not begin until a license was issued for a permanent repository. (PX 53 at 4-5). Based on these assumptions, DOE projected an acceptance rate of 400 MTUs in 1998, 600 MTUs in 1999, and 900 MTUs annually during 2000-2007, for a total of 8,200 MTUs through 2007. Id. No acceptance rates beyond 2007 were projected. DOE, however, never proposed and Congress never passed an amendment to remove the linkage between the MRS facility and the licensing of a permanent repository. (Kouts, Sys. Fuels, Tr. 3480, 3540-41).

In 1991, the General Accounting Office (“GAO”) reported that “it is unlikely that DOE will meet its objective to have an MRS facility operating by 1998.” (PX 156 at 19).

In 1995, President Clinton stated that he would veto proposed legislation removing the linkages between a permanent repository and an MRS facility. Sys. Fuels, Inc. v. United States, 79 Fed. Cl. 37, 47 (2007). Even though performance was “unlikely” and even though two of DOE’s three assumptions underlying the 1991 ACR’s 900 MTU rate were unrealistic and in fact never came to pass, DOE continued to apply the 900 MTU rate in its 1995 ACR. (Milner, May 3, 2002 Dep., Tr. 412; PX 60 at 4). Like all previous ACRs, the 1995 ACR stated that it was “for planning purposes only and thus is not contractually binding on DOE or the Purchasers.” (Pollog, Tr. 1247-48; PX 53 at 1-2; PX 60 at 1). By 1995, DOE had announced that it would not accept *any* spent fuel until a permanent repository or temporary facility was built, or until 2010 at the earliest. See Indiana Michigan, 422 F.3d at 1372 (citing 59 Fed. Reg. 27,007-27,008 (May 25, 1994); Maine Yankee, 225 F.3d at 1338).

When DOE began accepting DCSs in 1992, it expected the utilities to adhere to the 900 MTU rate set forth in its 1991-1995 ACRs. (Zabransky, Tr. 1498; Pollag, Tr. 1277-78; PX 53 at 7; PX 55 at 1090). Plaintiffs complied with DOE’s DCS instructions without complaint and submitted DCSs according to the allocation set forth in the most recent ACR/APR. (Stip. 17; Kunita, Tr. 746, 759; DX 119 at 0036; DX 129; DX 136; DX 170; DX 172). DOE suspended approval of the DCSs after the United States Court of Appeals for the District of Columbia Circuit issued its decision in Indiana Michigan Power Co. v. Dep’t of Energy, 88 F.3d 1272, 1277 (D.C. Cir. 1996), holding that DOE’s obligation to pick up spent fuel was not conditioned upon the existence of a facility to receive the spent fuel. (Stip. 18). Today, DOE is not approving any DCSs from any utility. (Zabransky, Tr. 1527; Pollog, Tr. 1290).

In 2004, DOE published another ACR, this time with a ramp up to a 3,000 MTU acceptance rate based on the assumption that a repository would be operational at Yucca Mountain, Nevada beginning in 2010. (PX 128 at 2). At trial, however, DOE’s David Zabransky testified that the earliest possible date for DOE performance now is 2017. (Zabransky, Tr. 1528).

F. Plaintiffs’ Mitigation Efforts

Progress Energy bases its spent nuclear fuel management plans upon the need to maintain “full core reserve” at each of its plants. (Stip. 4). Full core reserve means having “sufficient open and usable space in the spent fuel pool so you can discharge the entire reactor core into the spent fuel pool.” (Edwards, Tr. 231). Full core reserve is not an absolute or regulatory requirement, but for economic and risk management reasons is applied as a company objective.

The Progress Energy nuclear plants typically refuel on either eighteen-month or two-year cycles. (Edwards, Tr. 229). To refuel one of its nuclear power plants, Progress Energy removes spent fuel from a reactor and temporarily places it in a spent fuel pool connected to the reactor. (Edwards, Tr. 226-27). Spent nuclear fuel comes in the form of “assemblies,” which are measured in MTUs. (Edwards, Tr. 229). The number of assemblies in an MTU depends upon whether the reactor is a pressurized water reactor (“PWR”) or boiling water reactor (“BWR”). (Edwards, Tr. 229-30).

1. Brunswick

Brunswick has two spent fuel pools, which are not connected. (Stip. 50). CP&L increased the capacity of the Brunswick spent fuel pools in 1977 and 1984 by replacing the existing spent fuel storage racks with higher density racks. (Stip. 51). To alleviate spent fuel pool capacity constraints during 1989-2005, CP&L transported 3,853 spent fuel assemblies in 113 total shipments from Brunswick Units 1 and 2 to Harris. (Stip. 52). The spent fuel shipments from Brunswick to Harris are scheduled to end in 2008, due in part to the expiration of the cask license in October 2008, and because the remaining capacity at Harris ultimately will be needed for storage of Harris spent fuel. (Edwards, Tr. 244-45).

Consequently, Progress Energy is pursuing dry storage at Brunswick. (Edwards, Tr. 245). Dry storage at a nuclear plant typically takes the form of an “Independent Spent Fuel Storage Installation,” or “ISFSI.” As is typical for such large projects, Progress Energy commissioned an architect-engineer to look for a desirable location and define the scope of the dry-storage project by considering whether soil remediation or plant modifications would be required. (Edwards, Tr. 247-48). Progress Energy incurred approximately \$200,000 for the Brunswick ISFSI study. (Edwards, Tr. 247).

2. Harris

CP&L originally planned for the Harris plant to accommodate four nuclear units, numbered 1, 2, 3, and 4. (Stip. 27). CP&L intended that Units 1 and 4 would share spent fuel pools A and B, and Units 2 and 3 would share spent fuel pools C and D. (Stip. 28). Construction of Unit 1 and the Fuel Handling Building, housing all four spent fuel pools, was well under way when CP&L changed its plans. (Stip. 29). CP&L cancelled the construction of Units 2, 3, and 4, and instead, completed construction of Unit 1, portions of the Fuel Handling Building, and all four spent fuel pools. *Id.* CP&L partially completed the piping and major pieces of equipment associated with Units 2 and 3 that supplied spent fuel pools C and D, but CP&L did not complete the Spent Fuel Pool Cooling and Cleanup (“SFPC”) System for Units 2 and 3. *Id.* CP&L left in place the installed components of the SFPC System not required for Unit 1, but they remained dormant. (Stip. 29; Edwards, Tr. 262-65).

To maintain full core reserve at Robinson and Brunswick Units 1 and 2, CP&L shipped a number of spent fuel assemblies during the 1990's from Robinson and Brunswick to Harris for storage in Harris spent fuel pools A and B. (Stip. 30). To accommodate the Brunswick and Robinson spent fuel, CP&L added racks to the Harris A and B pools in 1991 and again to the B pool in 1996. (Stip. 31).

By November 1998, however, CP&L determined that, because of DOE's partial breach, it would have to activate pools C and D at Harris and arrange for the storage of spent fuel in those pools. (Edwards, Tr. 343-44; PX 95). CP&L incurred approximately \$32.7 million to activate and store spent fuel in the C and D pools. (PX-D1). This amount includes the cost of plant modifications, completing the component cooling water system, removing CRUD (an unwanted particulate material), changing technical specifications, performing public outreach efforts, and installing racks. (Edwards, Tr. 344-45, 352, 355, 377-78; PX 95; DX 304). CP&L also incurred approximately \$16.9 million in transportation costs shipping spent fuel from Robinson to Harris from 2000 through 2004, and from Brunswick to Harris from 2001 through 2005. (PX 137; PX-D1).

3. Robinson

Robinson has a single spent fuel pool. (Stip. 36). CP&L significantly increased the capacity of the Robinson spent fuel pool in 1983 by replacing some of the existing low density spent fuel storage racks with higher density racks. (Stip. 43). To alleviate spent fuel pool capacity constraints, CP&L transported spent fuel from Robinson to Brunswick from 1977 to 1981. (Stip. 37). In addition, CP&L shipped spent fuel from Robinson to Harris from 1990 to 2004. (Stip. 38). For these shipments, CP&L used rail casks, known as IF-300s, that it owned. (Stip. 39).

Progress Energy stopped the shipments of spent fuel from Robinson to Harris in 2004 due to license restrictions on the spent fuel shipping cask. (Edwards, Tr. 251). Progress Energy also knew that DOE would not perform under the Standard Contract for the foreseeable future, and that the Harris pools would be needed for spent fuel at the Harris plant. (Edwards, Tr. 244-45, 251).

In 2002, Progress Energy decided to build dry storage at Robinson. (Edwards, Tr. 251-52). Progress Energy incurred approximately \$36 million to build and load the Robinson ISFSI. (PX-D1). This amount includes the costs to design and build the ISFSI, construct a travel path, replace railroad lines, expand plant security and make modifications to the cask preparation area, including an upgrade to the crane to lift the heavier storage cask.

4. Crystal River

Crystal River has two interconnected spent fuel pools, A and B. (Stip. 21). FPC increased the capacity of the spent fuel pools in 1978 and 1991 by replacing the existing spent fuel storage racks with higher density racks. (Stip. 22). The licensed capacity of the Crystal River spent fuel pools after the 1978 and 1991 re-rack projects was 1,357 spent fuel assemblies. (Stip. 23). In 2001, Progress Energy re-racked Crystal River pool B by removing the spent fuel storage racks and replacing them with racks that could hold more spent fuel. (Edwards, Tr. 239, lines 11-25). This effort cost Progress Energy approximately \$4.6 million. (Edwards, Tr. 239, lines 5-8).

Discussion

A. Standards for Decision

In awarding damages for a partial breach of contract, the Court must endeavor “to place the injured party in as good a position as it would have been had the breaching party fully performed.” Indiana Michigan, 422 F.3d at 1373 (citing San Carlos Irrigation & Drainage Dist. v. United States, 111 F.3d 1557, 1562 (Fed. Cir. 1997)). “[T]he general principle is that all losses, however described, are recoverable.” Id. (quoting Restatement (Second) of Contracts § 347, cmt. c (1981)). If one party to a contract provides notice that it does not intend to perform, the non-breaching party becomes obligated to mitigate damages, meaning that it must take reasonable steps to avoid further losses or damages stemming from the breach. Sys. Fuels, Inc., 79 Fed. Cl. at 51-52; see also First Heights Bank, FSB v. United States, 422 F.3d 1311, 1317 (Fed. Cir. 2005) (stating “[t]he law requires that the non-breaching party make only ‘those efforts that are fair and reasonable under the circumstances.’”) (quoting Home Sav. of Am., FSB v. United States, 399 F.3d 1341, 1353 (Fed. Cir. 2005)). As the Federal Circuit has stated, “once a party has reason to know that performance by the other party will not be forthcoming, . . . he is expected to take such affirmative steps as are appropriate in the circumstances to avoid loss by making substitute arrangements or otherwise.” Indiana Michigan, 422 F.3d at 1375 (quoting Restatement (Second) of Contracts § 350, cmt. b). 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.” Citizens Fed. Bank v. United States, 474 F.3d 1314, 1320 (Fed. Cir. 2007).

The non-breaching party is entitled to recover its reasonable costs incurred in its efforts to mitigate damages. Plaintiffs must show that: (1) the damages were reasonably foreseeable by the breaching party at the time of contracting; (2) the breach was a substantial causal factor in the incurrence of damages; and (3) the damages are established with

reasonable certainty. Indiana Michigan, 422 F.3d at 1373 (citing Energy Capital Corp. v. United States, 302 F.3d 1314, 1320 (Fed. Cir. 2002)). Defendant also bears a burden of proof in cases involving mitigation damages. To eliminate or reduce Plaintiffs' mitigation damages, Defendant must show that Plaintiffs' efforts were inappropriate or unreasonable. Id. at 1375; see also First Heights Bank, 422 F.3d at 1316-17; S. Nuclear Operating Co. v. United States, 77 Fed. Cl. 396, 403-04 (2007); Pac. Gas & Elec. Co. v. United States, 73 Fed. Cl. 333, 406 (2006), appeal docketed, No. 2007-5046 (Fed. Cir. Jan. 24, 2007); Tennessee Valley Auth. v. United States, 69 Fed. Cl. 515, 523 (2006). Defendant may also seek deductions for costs that the non-breaching party avoided by not having to perform. See Lisbon Contractors, Inc. v. United States, 828 F.2d 759, 769 (Fed. Cir. 1987); Restatement (Second) of Contracts § 347(c).

“Because the purpose of a damages award is to put the non-breaching party ‘in as good a position as [it] would have been in had the breaching party fully performed,’ the logical starting point for a damages analysis is an understanding of the breaching party’s obligations under the contract.” Rumsfeld v. Applied Cos., 325 F.3d 1328, 1336 (Fed. Cir. 2003) (brackets in original); see also PSEG Nuclear, LLC, 465 F.3d at 1351 (“Any issues related to the types of damages permitted under the contract, if any, and the extent of those damages can be resolved by solely resolving the DOE’s contractual obligations.”); Pac. Gas & Elec. Co., 73 Fed. Cl. at 375 n.38 (holding that damages can be determined “[o]nly by determining the scope of defendant’s performance obligation”). The Court’s interpretation of DOE’s contractual obligation to pick up spent fuel is aided by three factors. First, as always, the Court looks to the plain and unambiguous language of the agreement. Hercules Inc. v. United States, 292 F.3d 1378, 1380 (Fed. Cir. 2002). Second, “[w]here a contract implements or fulfills a statutory requirement, the interpretation of the contract will be guided by the underlying statute.” Sys. Fuels, Inc., 79 Fed. Cl. at 52 (citing The Dalles Irrigation Dist. v. United States, 71 Fed. Cl. 344, 354 n.11 (2006)). Here, DOE entered into the Standard Contracts with nuclear utilities to fulfill the purposes of the NWPA, and the Standard Contract should be read in light of the intentions of the NWPA. See, e.g., Maine Yankee, 225 F.3d at 1341-42 (addressing the Standard Contract in terms of the NWPA’s requirements); Indiana Michigan Power Co., 88 F.3d at 1274-77 (looking to the NWPA to determine DOE’s obligations under the Standard Contract, and vacating DOE’s contract interpretation as contrary to the statute). Third, the Court looks to the intent of the parties. See Commonwealth Edison Co. v. United States, 56 Fed. Cl. 652, 662 (2003) (“The purpose of contract interpretation is to carry out the intent of the parties.”) (citing Gould, Inc. v. United States, 935 F.2d 1271, 1274 (Fed. Cir. 1991)).

In determining the contemporaneous understanding of the parties, the Court should give the greatest weight to those actions occurring closer in time to contract formation, before the contract has become the subject of a dispute. Sys. Fuels, Inc., 79 Fed. Cl. at 53

(citing Old Colony Trust Co. v. Omaha, 230 U.S. 100, 118 (1913) (“Generally speaking, the practical interpretation of a contract by the parties to it for any considerable period of time before it comes to be the subject of controversy is deemed of great, if not controlling, influence.”); Blinderman Constr. Co. v. United States, 695 F.2d 552, 558 (Fed. Cir. 1982) (“It is a familiar principle of contract law that the parties’ contemporaneous construction of an agreement, before it has become the subject of dispute, is entitled to great weight in its interpretation.”)). As the Court observed in System Fuels:

The closer in time to contract formation, and the more distant the prospect of litigation, the more reliable the parties’ practical interpretation should be. In the face of litigation, when “[s]elf-interest stimulates the mind to activity, and sharpens its perspicacity,” parties “often claim more, but rarely less, than they are entitled to.”

79 Fed. Cl. at 53 (quoting Brooklyn Life Ins. Co. of N.Y. v. Dutcher, 95 U.S. 269, 273 (1877)). These basic principles will guide the Court in the analysis of an unusual and somewhat complex factual setting.

B. Interpretation of the Standard Contract

The Standard Contract did not contain an express acceptance rate for DOE’s performance. It is not surprising that the Standard Contract lacked any mention of the precise quantity of spent fuel that DOE would begin accepting in 1998. Plaintiffs here, as well as all industry participants, executed their Standard Contracts in 1983, nearly 15 years before DOE’s acceptance of spent fuel was to begin. DOE would have been remarkably clairvoyant to have known in 1983 how much spent fuel would exist in 1998, and how much spent fuel would need to be collected in 1998 to avoid the need for additional storage facilities at individual nuclear plants. Moreover, in 1983, DOE at most would have been targeting industry-wide quantities of spent fuel, rather than reactor-specific quantities to include in each Standard Contract. A more sensible approach, and the one that DOE adopted, was to include obligations in the Standard Contract that would achieve the goals of the NWPA.

It is apparent to the Court that the NWPA’s purpose was to establish one or more central repositories for the storage of spent nuclear fuel so that nuclear utilities would not need to provide for additional spent fuel storage at their reactors. The NWPA specifically states as a finding that nuclear plant owners and operators have the responsibility to pay for interim storage of spent fuel “*until such waste and spent fuel is accepted by the Secretary of Energy in accordance with the provisions of this [Act].*” 42 U.S.C. § 10131(a)(5)

(emphasis added). The Standard Contract echoes the NWPA's objective by reciting that "DOE has the responsibility, following commencement of operation of a repository, to take title to the spent nuclear fuel . . . *as expeditiously as practicable* upon the request of the generator or owner." (PX 10 at 1) (emphasis added). The NWPA and the Standard Contract specify that DOE will begin performance by January 31, 1998. 42 U.S.C. § 10222(a)(5)(B); (PX 10, Article II, "Scope"). The Standard Contract applies to "*all*" spent fuel generated by Plaintiffs, which DOE "shall accept" and "dispose of . . . in accordance with the terms of this contract." (PX 10, Article IV, B, "DOE's Responsibilities").

DOE's efforts to draft the mission plan required by the NWPA, 42 U.S.C. § 10221(a), confirm the agency's contemporaneous understanding of its obligations. The NWPA mandated that DOE's mission plan contain an estimate of "the total repository capacity required to safely accommodate the disposal of all high-level radioactive waste and spent nuclear fuel expected to be generated through December 30, 2020" § 10221(a)(9). All of DOE's early mission plans, and related statements and actions, reflect an intent to achieve this objective:

- DOE's June 1983 report on financing the disposal of spent fuel is based upon an acceptance rate of 1,800 MTUs for the first five years, and 3,000 MTUs per year thereafter. (PX 8 at 9).
- A September 15, 1983 DOE memorandum states that "the central criteria for this schedule is an acceptance rate during the first 5 years such that no utility would have to build additional storage facilities after 1998." (PX 15 at 1046).
- DOE's Robert Morgan advised the nuclear industry in December 1983 that "[t]he basic strategy which we've outlined in the mission plan, is that beginning in 1998, utilities will not have to provide any additional storage facilities on site." (PX 19 at 11).
- DOE's December 20, 1983 draft mission plan stated that the "waste acceptance schedule will, initially, preclude the need for additional at-reactor storage after January 31, 1998 and, ultimately, remove from at-reactor storage all waste that is more than 5-years old." (PX 17 at 1068). The "Waste Acceptance Schedule" in this document projected two repositories that would begin accepting a total of 4,800 MTUs per year by 2003. *Id.* at 1082. The schedule shows the collection of all spent fuel generated through 2020, as mandated by the NWPA. *Id.*
- DOE's Michael Lawrence testified before Congress on February 22, 1984 that the "fundamental objective" of the NWPA was "to accept high-level radioactive waste

for safe management, storage and permanent disposal on a firm schedule, beginning not later than January 31, 1998,” and that “[b]y achieving this fundamental objective and implementing an appropriate waste acceptance schedule, this will initially preclude the need for additional at-reactor storage by nuclear utilities after January 31, 1998, and, ultimately, remove all eligible waste from at-reactor storage.” (PX 21 at 1102).

- Mr. Lawrence reiterated in comments to a July 23, 1984 DOE Richland, Washington Operations Office letter that “the minimum acceptance rate should be based upon the rate at which spent fuel is generated by civilian nuclear power reactors,” and that “[t]his would be consistent with the NWPA intent that no power reactor would require additional spent fuel storage after January 31, 1998.” (PX 26 at 1201).
- DOE’s February 1985 “Nuclear Waste Fund Fee Adequacy: An Assessment” confirms a five-year ramp up to a 3,000 MTU annual acceptance rate. (PX 27 at 3).
- DOE’s final version of the mission plan, published in June 1985, adopted as the “authorized system” a phased repository acceptance schedule with the first repository receiving 3,000 MTUs per year after a six-year ramp up period. (PX 31 at 26). The mission plan’s acceptance rates were based in part on attempting to keep pace with spent fuel discharges and alleviating the need for additional storage at nuclear reactors. (Pollog, Tr. 1231).
- The June 1985 mission plan also outlined an “Improved Performance System” illustrating the possible incorporation of an MRS into the program “*to accommodate DOE’s contractual commitments* to the utilities paying fees into the Nuclear Waste Fund. (PX 31 at 73) (emphasis added).

The foregoing DOE statements and actions soon after passage of the NWPA reflect the mutual expectations of the parties. See Sys. Fuels, Inc., 79 Fed. Cl. at 56 (“DOE’s behavior in the years that closely followed the enactment of the NWPA and contract formation serves as a more reliable basis for contract interpretation than the retrenching steps it took once the prospect of breach and liability appeared on the horizon.”).

Even as late as 1987, after DOE expected a five-year delay in performance at a permanent repository and received authority from Congress to build an MRS facility, DOE expected its permanent acceptance rate to exceed the industry’s generation rate by a comfortable margin. (See DX 59 at 6; PX 38 at 7). The Standard Contract required the 1987 ACR to “set forth the projected annual receiving capacity for the DOE facility(ies) . . . for ten (10) years following the projected commencement of operation of the initial DOE facility.

(PX 10, Art. IV, B, 5(b)). DOE's projected 2,650 MTU acceptance rate was consistent with the 1987 Mission Plan Amendment. (PX 38 at 7).

The fee schedule imposed upon the utilities also is relevant to the interpretation of the Standard Contract. The NWPAs contained a fee structure for establishing a Nuclear Waste Fund for purposes of performing radioactive waste disposal activities. See 42 U.S.C. § 10222. The Nuclear Waste Fund would be comprised in large part of the fees received from nuclear utilities under the Standard Contract, and would be used to achieve the purposes of the NWPAs, including the development of spent fuel repositories and the acceptance and transportation of spent fuel from individual reactors. § 10222(c)-(d). Through December 31, 2005, Progress Energy, CP&L, and FPC have paid DOE approximately \$661 million in fees for the disposal of spent fuel under the Standard Contracts. (Stip. 16). It is not plausible to conclude that these enormous fee payments were for anything other than DOE's full performance of the obligations described above. The provisions of the NWPAs, the Standard Contract, and DOE's contemporaneous understanding of its obligations all point to the conclusion that utilities holding a Standard Contract would not need to provide for additional spent fuel storage space after January 31, 1998.

In reaching the above conclusion, the Court is not applying a missing term to DOE's Standard Contract. Rather, the Court reads the Standard Contract in light of the NWPAs' purpose and the parties' expectations at the time of contract formation. The Standard Contract required DOE to begin accepting and transporting whatever amount of spent fuel was necessary beginning January 31, 1998 so that utilities such as Plaintiffs would not need to provide for additional spent fuel storage space after that date. There can be no question that DOE breached the Standard Contract by failing to collect any spent fuel in 1998 or in any year thereafter. Under such circumstances, the Court's obligation is to devise some reasonable method for the calculation of Plaintiffs' damages. Bluebonnet Sav. Bank, FSB v. United States, 266 F.3d 1348, 1357 (Fed. Cir. 2001) ("[T]he court's duty is to 'make a fair and reasonable approximation of the damages.'") (quoting Locke v. United States, 151 Ct. Cl. 262, 283 F.2d 521, 524 (1960)). The Court cannot allow Defendant to escape responsibility for its damages just because the exercise is complex or difficult. S. Nuclear Operating Co., 77 Fed. Cl. at 432 ("Difficulties in determining what DOE would have done had the DOE commenced performance as required under the Standard Contract does not shield defendant from liability."). As a reasonable basis for calculating Plaintiffs' damages, the Court is persuaded that an industry-wide acceptance rate of 3,000 MTUs per year would have satisfied DOE's contractual obligations. The Court agrees with Plaintiffs that 3,000 MTUs per year is a proper benchmark for measuring the steps that DOE should have undertaken, and intended to undertake, in executing the Standard Contract.

Defendant has advanced a number of arguments for its position that a 3,000 MTU acceptance rate was not a requirement of the Standard Contract. Defendant asserts, for example, that CP&L, by virtue of its membership and participation in the Edison Electric Institute (“EEI”) and the Utility Nuclear Waste Management Group (“UNWGM”), should be bound by comments that those associations submitted to DOE regarding the Standard Contract. Def.’s Post-Trial Brief at 17, 19, 40-42, 118-24. These comments, along with other industry submittals, purportedly reflect an understanding that the Standard Contract would not contain a specific acceptance rate. *Id.* Defendant failed, however, to present any reliable evidence showing that Plaintiffs agreed with or even knew about the comments of EEI, UNWGM, or others in the industry. At most, Defendant showed that Plaintiffs were members of two trade associations and attended some of their meetings. Based on the record presented at trial, the Court declines to impute selected industry comments to Plaintiffs.

Moreover, although some industry representatives argued in 1983 that a quantity of spent fuel ought to be included, and drafted proposed terms, the Standard Contract was not the product of negotiation. Rather, the NWPA authorized DOE to issue a contract that nuclear plant owners and operators would be required to sign. Any entity failing to execute the Standard Contract would not receive NRC licensing for continued operations. *See Maine Yankee*, 225 F.3d at 1337 (stating that the NWPA made entry into such contracts mandatory for the utilities); *Commonwealth Edison Co. v. United States*, 877 F.2d 1042, 1045 (D.C. Cir. 1989) (observing that utilities “had no real choice but to agree to whatever terms the federal government offered.”).

Defendant also argues that inserting a 3,000 MTU acceptance rate into the Standard Contract is improper because DOE expressly rejected inserting any numerical rate, and the nuclear industry understood that the mission plan was not a part of the Standard Contract. Def.’s Post-Trial Brief at 32-40, 118-27. It is true that none of the planning documents that contain the 3,000 MTU acceptance rate were part of the Standard Contract. Statements made in the statutorily mandated 1985 Mission Plan, and the contractually required 1987 ACR, however, along with other contemporaneous statements by DOE and Plaintiffs, demonstrate the parties’ understanding of DOE’s acceptance rate obligation *before* the specter of litigation tainted the process. The overwhelming weight of this evidence demonstrates that both DOE and Plaintiffs expected DOE to accept between 2,650 MTUs and 3,000 MTUs per year from the industry. Consequently, the 3,000 MTU rate is a reasonable measure of DOE’s performance absent the breach.

Finally, and perhaps most importantly, DOE’s actions from 1987 and thereafter were taken with an eye toward minimizing agency liability under the Standard Contract. As of 1987, DOE reported the existence of 35 pending lawsuits against it. *See Sys. Fuels, Inc.*, 79 Fed. Cl. at 56-57 (describing in detail how DOE’s 1991 ACR was “severely flawed.”); *S.*

Nuclear Operating Co., 77 Fed. Cl. at 415. DOE's David Zabransky conceded at trial that, faced with massive litigation, the 900 MTU rate was an agency attempt to minimize its obligations under the Standard Contract. (Zabransky, Tr. 1516-17). Similarly, the Court cannot accept that Plaintiffs would have agreed to pay the same staggering fees under the Standard Contract in exchange for 70 percent less performance from DOE (acceptance of 900 MTUs per year, instead of 3,000 MTUs per year). At an acceptance rate of 900 MTUs per year, DOE would never achieve the goals of the NWPA, because the acceptance rate would be less than one-half of the waste generated in any year.

Essentially, Defendant asserts that the Standard Contract allowed DOE to determine unilaterally the measure of its performance eight years after contract execution, and after DOE concluded that it would not be able to perform. When asked at closing argument whether Defendant was claiming that "as consideration for these \$660 million in fees paid by the Plaintiff, the pick-up rate is whatever the Government says it is," counsel for the Government responded that DOE was only limited by the duty of good faith. Closing Arg., Apr. 4, 2008 at 75. "There is a striking asymmetry when plaintiff pays in full for performance by defendant virtually at defendant's option." Commonwealth Edison Co., 56 Fed. Cl. at 664. If the Court were to accept this position, it would have little choice but to find Defendant's obligation illusory and the Standard Contract unenforceable. See id. at 663-64 (rejecting the Government's "minimalist interpretation of its obligations under the Standard Contract").

Twelve years ago, Defendant unsuccessfully argued the it had no obligation under the NWPA or the Standard Contract to collect and transport any spent fuel. See Indiana Michigan Power Co., 88 F.3d at 1275-77. The Court of Appeals for the District of Columbia Circuit noted:

[T]he Secretary [of DOE] now contends that the payment of fees was for nothing. At oral argument, one of the panel compared the government's position to a Yiddish saying: "Here is air; give me money," and asked counsel for the Department to distinguish the Secretary's position. He found no way to do so, nor have we.

Id. at 1276. At closing argument in the present case, Defendant only slightly modified this position:

[W]hen we're talking about the essence of the contract, the relevant question with regard to dates isn't where is the fuel going to be in 1998 or 1999 or 2000 or any year in the short term after 1998, it's

where is the fuel going to be in 2098 or 3098 or 10098. That's the essence of the deal.

Closing Arg., Apr. 4, 2008 at 75. It appears that in twelve years, Defendant's position has evolved from: (a) the utilities are paying fees to DOE for no performance to (b) the utilities are paying fees to DOE for baby steps toward performance in the year 2098, 3098, or 10098, or whatever year DOE chooses. The Court does not find this position at all persuasive.

Contrary to Defendant's position, Plaintiffs did not bargain for the promise that the Government would perform the Standard Contract a thousand or more years from now. It did not bargain for "the first baby steps toward getting to the point where the Federal Government can assume responsibility for all of this nuclear waste and tuck it away." Closing Arg., Apr. 4, 2008 at 76. Plaintiffs did not agree to pay \$661 million in fees under the Standard Contract in exchange for DOE unilaterally determining its own obligations *after* it realized that timely performance was not possible. Rather, Plaintiffs bargained for and have paid \$661 million in fees for DOE's commitment to take all of Plaintiffs' spent fuel as expeditiously as practicable beginning on January 31, 1998. The evidence closest in time to contract execution demonstrates that the parties understood this obligation to mean that DOE would accept enough fuel from Plaintiffs such that they would not have to build any additional at-reactor storage after January 31, 1998. The parties' understanding is supported by Congress's statement of purpose that the Federal Government should take responsibility for all spent fuel in order to eliminate the public health and safety risks associated with at-reactor storage of radioactive waste. Nothing in the Standard Contract or the NWPA supports Defendant's position that the 900 MTU acceptance rate fulfills DOE's obligation to take all of Plaintiffs' spent fuel as expeditiously as practicable.

C. Elements of Plaintiffs' Burden of Proof

Before addressing each of the disputed damages items, the Court will explain in greater detail the three elements that Plaintiffs must meet to satisfy their burden of proof. As previously noted, Plaintiffs must show 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 established with reasonable certainty.

1. Foreseeability

Plaintiffs may only recover for mitigation costs that were "reasonably foreseeable by the breaching party at the time of contracting." Indiana Michigan, 422 F.3d at 1373. "While the general response to a breach must be foreseen, the particular way that a mitigating decision is implemented need not." S. Nuclear Operating Co., 77 Fed. Cl. at 405.

Defendant does not contest the foreseeability element of Plaintiffs' claim. DOE certainly was aware that if it failed to pick up Plaintiffs' spent fuel, Plaintiffs would have to incur substantial costs storing the spent fuel on their own. See Indiana Michigan, 422 F.3d at 1375 ("Having been placed in a position where they are required to find alternate storage for SNF, the utilities must *de facto* accept responsibility to guard against the environmental impact of improperly-disposed and maintained SNF, a situation which the NWPAA was enacted to avoid."); Sys. Fuels, Inc., 79 Fed. Cl. at 59 ("DOE should have foreseen that its failure to perform under the Standard Contract would result in damages of the nature and magnitude that System Fuels claims"); Sys. Fuels, Inc. v. United States, 78 Fed. Cl. 769, 791 (2007) ("[T]he record contains clear and convincing evidence that on June 30, 1983, it was 'foreseeable' to DOE that, if performance could not be commenced by January 31, 1998, Plaintiffs would have to make interim arrangements"); S. Nuclear Operating Co., 77 Fed. Cl. at 404 ("That plaintiffs would generally incur storage expenses of the nature and magnitude sought here was foreseeable."); Tennessee Valley Auth., 69 Fed. Cl. at 528 (DOE recognized that "utilities might be forced to build additional on-site storage facilities if DOE were not successful in performing under its contracts for SNF disposal."). The Court agrees that Plaintiffs' efforts to store its spent fuel after it became aware that DOE was unlikely to perform, including activation of the Harris C and D pools, the Robinson ISFSI, the Brunswick ISFSI, and inter-plant shipments of spent fuel, should have been reasonably foreseen by DOE at the time of contracting.

2. Causation

Plaintiffs bear the burden of proving that DOE's partial breach was a substantial causal factor of each claimed mitigation cost. See Indiana Michigan, 422 F.3d at 1373. Although Indiana Michigan stated that the utilities must satisfy the substantial causal factor test, previous decisions of this Court have applied the more difficult "but-for" causation test. See, e.g., Sys. Fuels, Inc., 79 Fed. Cl. at 58 ("DOE's non-performance was a 'but-for' cause of [the utility's] decision to expand its dry fuel storage capacity."); N. States Power Co. v. United States, 78 Fed. Cl. 449, 462 (2007) (holding that utility presented sufficient evidence showing that it would have pursued cheaper interim storage options in the but-for world). But see Sys. Fuels, Inc., 78 Fed. Cl. at 804 (finding that DOE's partial breach was a substantial factor for incurring the costs to build a bay door); Pac. Gas & Elec. Co., 73 Fed. Cl. at 415 ("The court agrees with plaintiff that the government's breach of the Standard Contract was a substantial causal factor in plaintiff's need to remove the off-gas equipment from Humboldt Bay."). Indeed, at times, Plaintiffs use "but-for" causation language in its own brief. See Pls.' Post-Trial Brief at 68 (stating that "had DOE not breached, these specific activities would not have been necessary."). "[T]he selection of an appropriate causation standard depends upon the facts of the particular case and lies largely within the trial court's discretion." Citizens Fed. Bank, 474 F.3d at 1318. For each of the disputed

damages items here, the Court will apply the but-for test or the substantial causal factor test as appropriate.

Turning to the definition of “substantial causal factor,” Defendant contends that “[e]xpenses are recoverable as damages when, and only when, plaintiffs have established that they would not have been incurred in the absence of a failure by DOE [to perform].” Def.’s Post-Trial Reply Brief at 1-2; see also Def.’s Post-Trial Brief at 156 (stating that Plaintiffs may only recover for a cost that they could show with certainty were “incremental to the partial breach.”); Def.’s Post-Trial Reply Brief at 31-32 (“A plaintiff sustains its burden of proof *only* by presenting a complete picture of its actual expenses and, as a basis for comparison, a complete picture of the expenses that it would have incurred absent a breach.”) (emphasis in original); Def.’s Post-Trial Brief at 115 (arguing that “Indiana Michigan requires Progress Energy to show that, at a minimum, had DOE begun accepting fuel in 1998, it would not have incurred the costs it now seeks as damages”). The Court reads these statements essentially as slight variations of the “but-for” causation test. As explained above, while it is true that Plaintiffs may recover if they can show that they would not have incurred a cost but-for the breach, it is also true that Plaintiffs may recover if they can show that the breach was a substantial causal factor in the claimed cost. Defendant’s many statements suggesting otherwise are not well founded.

To meet the substantial causal factor test, Plaintiffs must definitely establish a causal connection and show that the mitigation costs flowed “inevitably and naturally” from the breach. Sys. Fuels, Inc., 78 Fed. Cl. at 795 (quoting Franconia Assocs. v. United States, 61 Fed. Cl. 718, 750 (2004)); see also Am. Fed. Bank, FSB v. United States, 72 Fed. Cl. 586, 598 (2006) (“Provided that a causal connection can be ‘definitely established’ between the breach of contract and events that subsequently occur, the harm to the injured party from such consequences must be recoverable as damages in mitigation, while obversely, the benefits of the direct consequences of the breach must be credited against a recovery.”) (internal citations omitted). While Plaintiffs need not show that DOE’s partial breach was the sole cause of an incurred cost, Plaintiffs must show that the alleged mitigation effort was more than a purely business judgment that would have been made irrespective of the breach. Compare Citizens Fed. Bank, 474 F.3d at 1320 (affirming the trial court’s application of the substantial factor test and its finding that the plaintiff may recover for an activity that was “due in part to mitigate the effects” of the breach), and S. California Fed. Sav. & Loan Ass’n v. United States, 422 F.3d 1319, 1337 (Fed. Cir. 2005) (affirming the trial court’s finding that the breach “was the principal cause of [the plaintiff’s] recapitalization and was the substantial factor in [the plaintiff] incurring higher costs of funds after the breach”), with Indiana Michigan, 422 F.3d at 1376 (affirming the trial court’s factual finding that the utility’s 1989 decision to re-rack was made “in the normal course of business” before the utility had reason to believe that DOE would not perform); see also California Fed. Bank v. United States, 395

F.3d 1263, 1268 (Fed. Cir. 2005) (holding that a causal connection between the breach and the claimed damages “must be definitely established,” but “[t]hat is not to say that the breach must be the sole factor or sole cause in the [damages]”); Sys. Fuels, Inc., 78 Fed. Cl. at 795; Franconia Assocs. v. United States, 61 Fed. Cl. 718, 750 (2004) (“[P]laintiffs need not show that each dollar claimed was entirely unaffected by outside events.”).

“[I]n determining whether a decision was substantially caused by DOE’s delay, reasonable not absolute certainty suffices.” Yankee Atomic Elec. Co. v. United States, 73 Fed. Cl. 249, 268 (2006), appeal docketed, No. 2007-5025 (Fed. Cir. Dec. 7, 2006). As the Court of Claims noted in Locke v. United States:

[T]he constant tendency of the courts is to find some way in which damages can be awarded where a wrong has been done. Bigelow et al. v. RKO Radio Pictures, 327 U.S. 251, 265, 66 S.Ct. 574, 90 L.Ed. 652. Difficulty of ascertainment is not to be confused with right or recovery. Nor does it exonerate the defendant that his misconduct, which has made necessary the inquiry into the question of harm, renders that inquiry difficult. Eastman Kodak Co. v. Southern Photo Materials Co., 273 U.S. 359, 379, 47 S.Ct. 400, 71 L.Ed. 684. The defendant who has wrongfully broken a contract should not be permitted to reap advantage from his own wrong by insisting on proof which by reason of his breach is unobtainable. Crichfield v. Julia, 2 Cir., 147 F. 65.

151 Ct. Cl. 262, 283 F.2d 521, 524 (1960).

To determine which costs were caused by DOE’s partial breach, Progress Energy created a causation model representing the spent fuel management actions that Plaintiffs did take in the real world and those actions that Plaintiffs would have taken had DOE performed at the 3,000 MTU rate. (PX 137; Edwards, Tr. 279; Worthington, Tr. 860). Progress Energy also created a second model at the request of the Government that represented the actions Progress Energy would have taken had DOE performed at the 900 MTU rate. (DX 329; Edwards, Tr. 502). Mr. Worthington, Lead Engineer of Progress Energy’s Spent Fuel Management Unit, was the employee primarily responsible for preparing the 3,000 MTU causation model. (Worthington, Tr. 785; Edwards, Tr. 483). Steve Edwards, supervisor of Progress Energy’s Spent Fuel Management Unit, directed and reviewed all of Mr. Worthington’s work on the 3,000 MTU rate causation model. (Edwards, Tr. 279-80).

Progress Energy used the DOE’s 2004 APR/ACR projections as the measure of DOE’s performance. (Worthington, Tr. 863). According to the 2004 APR/ACR, DOE

would begin accepting spent fuel at a permanent repository in 2010 and would accept 400 MTUs in 2010, 600 MTUs in 2011, 1,200 MTUs in 2012, 2,000 MTUs in 2013, and 3,000 MTUs thereafter. (Worthington, Tr. 863; PX 128 at 2). Progress Energy applied these projections beginning with 1998 as Year 1. (Edwards, Tr. 303). The 2004 APR/ACR projections slightly differ from the projections in early planning documents such as the 1985 Mission Plan and the 1987 ACR, primarily in the ramp-up rate during the early years of operation. (Compare PX 128 at 2, with PX 38 at 7, and PX 31 at 26). As Mr. Edwards testified, “[a]ll of them seemed to get to the 3,000 [MTU rate] in about a four-to-five-year time frame, . . . how you got to that 3,000 [MTU rate] varied Since it got to the rate that we thought was the right rate to use consistent with the earlier documents and it was the most recently issued from DOE, we decided that this was the most appropriate rate to use.” (Edwards, Tr. 304).

Based on the industry-wide acceptance rate and each reactor’s acceptance priority ranking, Progress Energy knew precisely how much spent fuel DOE would have accepted from each of its reactors. For example, in Year 1 when DOE would only accept 400 MTUs from the industry, DOE would not accept any spent fuel from Plaintiffs. (PX 128 at B.2). In Year 2, DOE would accept only 69.7 MTUs from the Robinson plant. (PX 128 at B.4). In Year 5, when the industry-wide acceptance rate reached 3,000 MTUs, DOE would accept 102.5 MTUs from Brunswick, 43.3 MTUs from Robinson, and 46.3 MTUs from Crystal River. (PX 128 at B.13-14). Knowing exactly how much storage space was available at its four plants in 1998, how many spent fuel assemblies and MTUs CP&L and FPC generated each year after 1998, and DOE’s precise quantities for acceptance at the 3,000 MTU rate, Progress Energy assessed with reasonable certainty what storage activities it would have had to take absent DOE’s partial breach. (Edwards, Tr. 302; PX 137).

After using its causation model to isolate the breach-related projects, Progress Energy identified and collected the costs for the breach-related projects using the accounting and project number system that Progress Energy uses to track costs in the normal course of business. (Edwards, Tr. 320-23; Calvello, Tr. 1594, 1618; PX 140). Progress Energy excluded some costs that it concluded were not caused by DOE’s partial breach. (Edwards, Tr. 328-336). For example, Progress Energy did not include \$6.7 million for the cost of shipping 782 assemblies to the Harris pool, and \$1,087,280 for the cost of changing the racks in the Harris B pool. (Stip. 59; Edwards, Tr. 335-36). Progress Energy thoroughly analyzed its data until, in Mr. Edwards’s words, “it was accurate to the best of our knowledge.” (Edwards, Tr. 321). Plaintiffs’ \$91,029,704 claim results from this process. (See Edwards, Tr. 279). Except where identified to the contrary below, the Court concludes that DOE’s partial breach caused Progress Energy to incur the claimed costs as part of its effort to maintain full core reserve and avoid a power plant shutdown.

3. Reasonable Certainty

Plaintiffs may only recover those damages that they can show with reasonable certainty. Indiana Michigan, 422 F.3d at 1373. “While the amount of damages need not be ‘ascertainable with absolute exactness or mathematical precision[,]’ recovery for speculative damages is precluded.” Id. (holding that utility may recover for actual damages incurred to the time of trial, but not for speculative prospective mitigation damages) (quoting San Carlos Irrigation & Drainage Dist., 111 F.3d at 1563) (alteration in original). With these principles in mind, the Court ordered the parties to undergo a comprehensive pretrial accounting review process to reach agreement as much as possible on the costs associated with each of Progress Energy’s mitigation efforts. See March 23, 2006 Pretrial Order on Damages. With Progress Energy’s cooperation, Defendant reviewed invoices, purchase orders and contracts, accounting records and work orders, and other electronic data. (DX-D5 at 6). As a result of this process, Defendant agreed that Progress Energy’s incurred costs included \$4,675,392 for the Crystal River Re-rack, \$32,734,951 for the Harris C&D Pool Activation, \$16,975,181 for the spent fuel shipment campaigns, \$36,436,059 for the Robinson ISFSI, and \$208,120 for the Brunswick ISFSI, for a total of \$91,029,704 in claimed damages through December 31, 2005. Id. at 8. Defendant does not contest the accuracy of the dollar amounts for the vast majority of Progress Energy’s claim, \$90,684,002 to be exact.

D. Defendant’s Reduction of Damages

Once Plaintiffs demonstrate foreseeability, causation, and certainty, Defendant may reduce damages by showing either that Plaintiffs did not undertake reasonable mitigation efforts, or that the efforts they did undertake were unreasonable. See Sys. Fuels, Inc., 79 Fed. Cl. at 52 (citing Tennessee Valley Auth., 69 Fed. Cl. at 523); see also Indiana Michigan, 422 F.3d at 1375; First Heights Bank, 422 F.3d at 1316-17; S. Nuclear Operating Co., 77 Fed. Cl. at 403-04; Pac. Gas & Elec. Co., 73 Fed. Cl. at 406. Defendant may also seek deductions for costs that Plaintiffs avoided by not having to perform. Lisbon Contractors, 828 F.2d at 769; Restatement (Second) of Contracts § 347(c), cmt. d; Corbin on Contracts § 57.10 (“The only saving that is to be deducted is the saving of expense with respect to performance by the plaintiff that the defendant’s breach has made unnecessary.”). “[A]ny ‘benefits’ the government seeks to offset must be shown to a reasonable certainty, or they must be denied as too speculative to meet the standards set forth by the Federal Circuit in Indiana Michigan.” Sys. Fuels, Inc., 79 Fed. Cl. at 71 (internal citations omitted).

The evidence shows, and Defendant does not contest, that when Progress Energy realized DOE was unlikely to perform, it undertook efforts to store its fuel on an interim basis and avoid having to shut down its power plants. Defendant does not seek any reductions on the grounds that Progress Energy failed to take appropriate steps to mitigate

the loss, or that Progress Energy's mitigation efforts were unreasonably costly. Defendant, does however, seek a \$9,818,462 reduction for costs avoided because of the breach that the Court will address below.

E. Disputed Mitigation Costs

The parties agree that, under the 3,000 MTU measure of performance, Plaintiffs should recover \$61,301,941 in mitigation damages. Def.'s Post-Trial Brief at 73; (Johnson, Tr. 2018-19; DX-D5 at 42-43). The remaining \$29,727,762 of Plaintiffs' claim consists of eleven items that Defendant asserts are not recoverable even at the 3,000 MTU rate. Defendant argues that Plaintiffs failed to meet their burden of proof under Indiana Michigan for nine items, that an additional \$9,818,462 should be deducted to account for costs that Plaintiffs "avoided" by not having to perform, and that \$1,996,045 in imputed interest expense is barred by law. The Court will address each of the disputed items below.

1. CRUD Cleanup and Rack Disposal at Harris C & D Pools

When CP&L introduced Brunswick fuel into the Harris borated⁵ pools, it caused a particulate material known as "CRUD" to accumulate in the C and D pools. (Edwards, Tr. 377). Unlike most radioactive materials, CRUD has a very short half-life of about five years. (Edwards, Tr. 379-80). Currently, the Harris plant is licensed to operate through 2026, and an application to renew the license through 2046 is under review. (Edwards, Tr. 385). In the absence of DOE's breach, CP&L would not have activated the C and D pools, and, thus, would have allowed the CRUD to remain in the pools until the Harris plant is decommissioned, either in 2026 or in 2046. (Edwards, Tr. 379-80). After sitting either twenty or forty years, the Harris CRUD would have become less radioactive, thereby reducing exposure risks to Progress Energy employees and allowing Progress Energy to ship it offsite under existing regulations for "low level" radioactive waste. (Edwards, Tr. 384-85). As such, CP&L's strategy was to leave the CRUD in the pools until plant decommissioning when it would be less expensive to remove it. (Edwards, Tr. 385).

As a direct result of DOE's partial breach and the need to activate the C and D pools, however, CP&L had to remove the CRUD in 1999 and 2000. (Edwards, Tr. 379). At that time, the CRUD had not yet aged sufficiently to be shipped off site and CP&L had to design special collection vessels to store the CRUD until it decayed long enough to allow shipment. (Edwards, Tr. 384). CP&L incurred \$297,294 for the cost of CRUD clean-up and \$330,345 for the costs of sludge clean-up. (DX-D5 at 43). Similar to the CRUD, DOE's partial breach

⁵ The term "borated" is an adjective referring to the state of being mixed or impregnated with borax or boric acid. Webster's New Collegiate Dictionary 132 (10th ed. 2001).

required CP&L to remove unused racks from the C pool which CP&L would have otherwise left there indefinitely. (Edwards, Tr. 387). CP&L incurred \$174,636 for the cost of disposing of the unused racks. (DX-D5 at 43).

Defendant does not dispute that DOE's partial breach required CP&L to remove the CRUD, sludge, and unused racks in order to activate the Harris C and D pools. Nonetheless, Defendant contends that \$802,275 should be deducted from Progress Energy's claim because Progress Energy would need to remove and dispose of the CRUD, sludge, and unused racks at decommissioning. Def.'s Post-Trial Brief at 145; (Maret, Tr. 1766-67; Johnson, Tr. 2016).

The evidence persuasively shows that the cost of removing and disposing of the CRUD, sludge, and unused racks was caused by DOE's partial breach. Defendant may reduce the damages award where it shows that the mitigation costs were unreasonable, or that as a result of the partial breach, CP&L avoided an expense. As the Court held in System Fuels, Inc.:

Indiana Michigan limits recoverable damages to those that can be "shown with reasonable certainty," such that "recovery for speculative damages is precluded." Correlatively, any "benefits" the government seeks to offset must be shown with reasonable certainty, or they must be denied as too speculative to meet the standards set forth by the Federal Circuit in Indiana Michigan.

Sys. Fuels, Inc., 79 Fed. Cl. at 71 (internal citations omitted) (holding Defendant failed to prove offsets with reasonable certainty).

It is true that, had DOE performed and CP&L not been forced to activate the Harris C and D pools to mitigate the damage caused by DOE, Progress Energy would have been required to remove CRUD, sludge, and unused racks at plant decommissioning. At present, however, Progress Energy's Harris plant decommissioning clean-up is likely to occur in 2046. As Progress Energy correctly points out:

It is simply impossible to estimate the cost of these disposal activities 40 years from now. Indeed, during decommissioning these would not be isolated costs but part of a much larger disposal and cleanup effort. And, even if one could isolate the potential costs four decades hence, they would likely be much less than the dollars actually expended in or around 1998 because of economies of scale and, with regard to CRUD, the radioactivity would have

decayed significantly as it sat in the pool, rendering its handling and disposal far cheaper than it was in the real world.

Pls.' Post-Trial Brief at 36 (citing Edwards, Tr. 383-85). The Court finds Plaintiffs' analysis to be persuasive. Absent any credible evidence showing with reasonable certainty Progress Energy's CRUD, sludge, and unused rack clean-up costs in 2026 or 2046, the Court will not deduct such speculative future amounts from the damages award. The cost for the CRUD, sludge, and unused rack cleanup will be included in Plaintiffs' damages award.

2. Railroad Track Maintenance

Progress Energy included \$260,037 in railroad track maintenance costs in its claim. (DX-D5 at 43). Without doubt, DOE's partial breach caused Progress Energy to transport spent fuel by rail to the Harris plant for interim storage. See Def.'s Post-Trial Brief at 153. In order to safely ship the spent fuel, Progress Energy periodically performed maintenance and safety checks on the rail lines. (Edwards, Tr. 390-91). Thus, DOE's partial breach was a substantial causal factor in the maintenance of the rail lines.

The evidence introduced at trial shows that Progress Energy, absent DOE's breach, would have preferred for DOE to use rail casks to pick up the spent fuel. (Edwards, Tr. 389, 580; Zabransky, Tr. 1528). There is no evidence in the record, however, demonstrating that DOE would have used rail casks. See id. Thus, the method of DOE's hypothetical performance absent the breach is entirely speculative. See Sys. Fuels, Inc., 79 Fed. Cl. at 71 ("It is not possible to ascertain the method DOE will ultimately use for SNF acceptance.").

Defendant argues that Progress Energy should not recover for maintenance costs because Plaintiffs "failed to prove that they would not have made any portion of their expenditures upon railroad track maintenance . . . if DOE had commenced accepting fuel in 1998." Def.'s Post-Trial Brief at 153; (see also Johnson, Tr. 1962). Put another way, the Government speculates that DOE would have accepted fuel by rail had it performed, and argues that Plaintiffs may only recover if they disprove the Government's speculation. The Government cites no authority for this position, and this Court expressly has rejected it on multiple occasions. See, e.g., Sys. Fuels, Inc., 79 Fed. Cl. at 71; Sys. Fuels, Inc., 78 Fed. Cl. at 795, 801-03. See also Restatement (Second) of Contracts § 352, cmt. a (stating that doubts shall be resolved against the breaching party).

Plaintiffs have demonstrated that DOE's partial breach was a substantial causal factor of the cost of railroad track maintenance, and Defendant has provided no reason to deduct the costs. The Government does not even allege that it was unreasonable for Progress Energy to conduct the railroad maintenance work or that Progress Energy spent an unreasonable sum

on this project. The cost for the railroad track maintenance will be included in Plaintiffs' damages award.

3. Internal Labor

Progress Energy used the labor of 511 employees on breach-related projects at a cost of \$15,175,982. (DX 308 at 17). Defendant agrees that Progress Energy's use of internal labor was reasonably foreseeable and that Progress Energy proved its labor costs with reasonable certainty. Defendant contends, however, that 29 percent of the labor costs, or \$4,383,222, were not "incremental to the partial breach." Def.'s Post-Trial Brief at 156-59; (see also Johnson, Tr. 2015; DX 308 at 18, n. 55; DX-D5 at 43). According to Defendant's expert, Mr. Johnson, only the labor costs for hourly employees, and salaried employees who spent more than 50 percent of their hours on a breach-related project during any one year qualify as "incremental to the breach." (Johnson, Tr. 2004-08). Under this approach, 112,843 hours of work on breach-related mitigation projects by more than 300 salaried employees do not qualify as "incremental to the breach." (PX 166). For example, applying his "50 percent rule," Mr. Johnson concludes that Larry Bacote's 1,141 hours of labor were incremental to the breach because all 1,141 hours occurred in 2005. By the same rule, Mr. Johnson concludes that none of John Jankens's 3,599 hours of labor were incremental to the partial breach because Mr. Jankens never worked more than 830 hours on breach-related projects in any one year. (PX 166 at 1-2). Despite Mr. Johnson's testimony that his opinion reflected "a reasonable assertion of the amount of incremental labor," the Court finds his "50 percent rule" to be arbitrary and without support in the law. (Johnson, Tr. 2004).

As Defendant admits in its post-trial brief, similar arguments have been considered and uniformly rejected by this Court. See Sys. Fuels, Inc., 79 Fed. Cl. at 67 (holding that "charges for internal labor shall be allowed as mitigation costs without any reduction"); Sys. Fuels, Inc., 78 Fed. Cl. at 798 (rejecting the Government's argument that internal labor costs were not incremental); S. Nuclear Operating Co., 77 Fed. Cl. at 442 (finding that use of internal labor was "less expensive than hiring contractors which reduces costs to ratepayers and ultimately to the federal taxpayers who bear the burden of judgments entered by this court"); Pac. Gas & Elec. Co., 73 Fed. Cl. at 408 ("To the extent that the costs of PG & E's internal labor were in fact performed on a 'breach-related project,' . . . the court finds that such labor costs should be properly awarded to plaintiff."); Tennessee Valley Auth., 69 Fed. Cl. at 538-39 (holding that whether the utility would have paid its salaried employees in all events was immaterial).

In Northern States Power Co., the Court rejected the defendant's challenge to internal labor costs for 200-plus employees who charged, on average, slightly more than one hour per week to breach-related activities over an eight year period. The Court reasoned:

We are unable, however, to discern any principled distinction between the employee fully engaged in breach-related work and the employee whose involvement in such work may have been only limited. In either case, a cost was incurred that is properly chargeable to the activity benefitted – the development of a dry storage facility [I]t is quite appropriate to recognize as a cost of mitigation any diversion of labor that was applied to the accomplishment of that mitigation ‘[T]he test for recovery is a targeted one: whether use of the internal resources by [plaintiff] deprived it of the ability to employ those resources on other projects.’ We adopt this conclusion as our own.

N. States Power Co., 78 Fed. Cl. at 468 (quoting Tennessee Valley Auth., 69 Fed. Cl. at 539). The Court sees no basis to depart from this well-reasoned position. Every hour that a Progress Energy employee spent on a breach-related project was an hour that the employee did not spend doing other productive work for Progress Energy. The evidence shows that DOE’s partial breach caused Progress Energy to spend \$15,175,982 in labor costs on breach-related projects. Defendant has not produced any evidence showing these costs to be unreasonable. Plaintiffs’ \$15,175,982 in labor costs will be included in their damages award.

4. Overhead

Plaintiffs’ damages claim includes \$2,336,679 for stores overhead and \$1,895,031 for indirect overhead expenses. Stores overhead consists primarily of warehousing costs such as procurement, expediting, quality control, receipt inspections, material handling, and related labor costs. (Edwards, Tr. 405-06). Indirect overhead consists of Construction Work in Project costs, which pays the salaries of management level individuals and financial persons. (Edwards, Tr. 407-08; Calvello, Tr. 1613-15). All projects that use stores overhead and indirect overhead, including breach-related projects, are allocated a portion of the costs through specific project codes in Progress Energy’s internal accounting system. (Edwards, Tr. 592-93; Calvello, Tr. 1611-13). Most of Progress Energy’s overhead expenses are fixed, meaning they do not change with the volume of business activity. (Edwards, Tr. 597; Johnson, Tr. 1988-90; DX-D5 at 28). Progress Energy did not quantify the amount, if any, by which its overhead costs increased as a result of the breach-related projects. (Edwards, Tr. 600-02).

Defendant does not dispute that Progress Energy used warehousing services for breach-related projects. (Johnson, Tr. 2029). Rather, Defendant contends that Progress Energy may not recover any portion of overhead costs because they are fixed costs, and thus not “incremental to the breach.” Def.’s Post-Trial Brief at 159. According to Defendant,

Progress Energy failed to show any economic harm resulting from DOE's partial breach. Defendant argues that "Plaintiffs supplied no evidence, as they could have attempted, that fluctuations in their overhead charges coincided with their engagement in breach-related activities" Def.'s Post-Trial Reply Brief at 46. Consequently, Defendant seeks to reduce Progress Energy's stores overhead claim by \$2,190,504 and its indirect overhead claim by \$1,819,575. (DX-D5 at 43). Plaintiffs respond that if breach-related projects did not receive their fair allocation of overhead, then other projects would assume a disproportionate amount of the total overhead costs. (Calvello, Tr. 1613).

The Court sees no basis in law or logic for Defendant's position. Plaintiffs' overhead costs were incurred and are properly attributable to mitigation projects and activities. If no overhead charges were allocated to the mitigation projects, Plaintiffs' other projects would be more expensive than anticipated. *Id.* Overhead, by definition, is a cost of doing business, and for some period of time, part of Progress Energy's "business" was mitigating DOE's partial breach. Overhead recovery is necessary to compensate Plaintiffs fully. See *Sys. Fuels, Inc.*, 78 Fed. Cl. at 799-800 (rejecting the Government's principle that all "loader costs" [overhead] would have been incurred absent DOE's breach). The Court will allow the recovery of Plaintiffs' stores overhead and indirect overhead expenses.

5. Robinson Crane Studies

Prior to DOE's partial breach, CP&L used its 125-ton capacity Robinson crane to load 75-ton IF 300 casks for shipment to Harris and Brunswick. (Edwards, Tr. 251-52, 261-62; Worthington, Tr. 823-24). As part of its \$36 million Robinson ISFSI project, Progress Energy concluded that it would be "prudent" to determine if its existing Robinson crane was qualified to lift the heavier 110-ton ISFSI dry-storage casks. (Worthington, Tr. 824, 857). Progress Energy commissioned contractors to study the need for a crane modification at a cost of \$368,121, and as a result, did in fact modify and upgrade the Robinson crane. Although Defendant does not challenge the cost of the Robinson ISFSI or the cost of the crane upgrade, it challenges the cost of the crane studies. In Defendant's words, Progress Energy "failed to explain why the costs incurred to perform these studies would not have been performed in the absence of any delay by DOE." Def.'s Post-Trial Reply Brief at 48.

Defendant's contention is without merit. Defendant does not contest that DOE's partial breach directly led to Progress Energy's need to construct the Robinson ISFSI and to upgrade the crane to load the heavier dry storage casks. Progress Energy could not have known if it was necessary to upgrade the crane unless it commissioned the studies that Defendant now challenges. Mr. Worthington, Progress Energy's engineer responsible for the installation of the crane modification, testified that the crane studies would have been necessary had the crane not needed to be modified to load the ISFSI dry storage cases.

(Worthington, Tr. 824-32). On these facts, it is clear that DOE's partial breach was a substantial causal factor in the cost of the Robinson crane study. Defendant produced no evidence showing that the Robinson crane study was an unnecessary expense or that its costs were unreasonable. The \$368,121 for the Robinson crane study will be included in Plaintiffs' damages award.

6. Licensing and Communications Expenses for Harris Pools

In order to activate the Harris C and D pools, CP&L had to seek regulatory approval from the NRC. (Edwards, Tr. 345). The NRC's licensing process allowed for community and environmental groups to oppose a utility's application, and the occurrence of such opposition was common. (Edwards, Tr. 346-50). The NRC's rules of practice for licensing procedures provided that "[a]ny person whose interest may be affected by a proceeding and who desires to participate as a party shall file a written petition for leave to intervene." 10 C.F.R. § 2.174 (1998). Full Atomic Safety Licensing Board ("ASLB") hearings often were held for large capital projects at nuclear power plants. (Edwards, Tr. 348-49).

North Carolina Waste Awareness Network, an environmental organization, and the Board of Commissioners of Orange County ("BCOC"), a governmental organization, actively opposed CP&L's opening of the Harris C and D pools. (Edwards, Tr. 349). The BCOC filed formal oppositions with the NRC, and the NRC conducted full ASLB hearings. (Edwards, Tr. 345, 349-50). CP&L ultimately prevailed in its position that the activation of the Harris C&D pools posed no significant safety hazards. See In re Carolina Power & Light Co., 53 N.R.C. 113 (2001) (denying BCOC's petition for review of staff's issuance of license amendment).

CP&L also engaged in community outreach efforts when dealing with plant modifications and contested NRC proceedings. (Edwards, Tr. 350-51). CP&L undertook such efforts when seeking approval of the C and D pool activation. (Edwards, Tr. 352). CP&L incurred \$1,800,500 in NRC proceedings to defend its licensing request, and \$100,288 for its community outreach efforts related to this request. (DX-D5 at 43). In the absence of DOE's partial breach, these expenditures would not have been necessary. (Edwards, Tr. 352-53); see also N. States Power Co., 78 Fed. Cl. at 464 ("[P]laintiff should not have to bear the unavoidable costs associated with [an activity] that defendant acknowledges constituted an otherwise reasonable and successful effort to mitigate damages."). Defendant's argument that these costs were not a direct result of DOE's delay in performance is without any basis. The \$1,900,788 in legal and communications expenses will be allowed.

7. Upgrade to the Harris Component Cooling Water System

Plaintiffs claim \$1,166,640 as the cost of upgrading the component cooling water (“CCW”) system at the Harris plant. Plaintiffs assert that these upgrades primarily were due to the opening of the C and D spent fuel pools at the Harris plant, while Defendant argues that the CCW upgrades were necessary to accommodate the increased heat loads from CP&L’s power uprate and steam generator replacement. (Maret, Tr. 1774-75; DX 307 at 8-10; DX-D4 at 11-14). The Court must determine whether DOE’s failure to accept spent fuel at the Harris plant beginning January 31, 1998 was a substantial causal factor of CP&L’s CCW upgrade expense.

The work that CP&L performed on the CCW upgrade consisted of replacing pump impellers in the cooling system, enabling more cold water to circulate at a higher pressure. (Edwards, Tr. 547; Tibbitts, Tr. 1034). CP&L authorized the CCW upgrade for three independent reasons, all relating to dissipating heat more effectively: (1) activation of the C and D spent fuel pools; (2) the power uprate enhancement; and (3) the steam generator replacement. (Edwards, Tr. 543).

One means of analyzing this issue is to consider the increased heat load from each source. Defendant’s expert, Mr. Maret, established that, aside from the opening of the C and D spent fuel pools, the additional heat load placed on the CCW system after power uprate was 19.5 MBTU/hour – 13.2 MBTU/hour in additional heat load on the residual heat remover (“RHR”) heat exchanger, and 6.3 MBTU/hour in additional heat load in the A and B spent fuel pools. (Maret, Tr. 1785-89; DX 307 at 10; DX-D4 at 13-14). In comparison, the licensed heat load limit for the C and D pools increased from 1.0 MBTU/hour to 7.0 MBTU/hour. *Id.* The combined increase in heat load on the CCW system attributable to the RHR heat exchanger and the A and B pools is more than twice the total allowable heat load in the C and D pools. *Id.* This data strongly suggests that the CCW upgrades would have been needed regardless of the opening of the C and D pools.

CP&L’s contemporaneous documentation is consistent with this suggestion. In a January 1998 presentation, Mr. Edwards addressed the advantages and disadvantages of utilizing the CCW system to provide cooling for the C and D pool activation. (Edwards, Tr. 554; DX 185 at 9205). Mr. Edwards identified as one of the disadvantages the fact that “there [would be] inadequate long-term (post power up rate) CCW margin without plant modification (additional heat exchanger capacity and pump upgrades).” *Id.* In a related bar graph, the largest single annual increase in heat load occurs in the year when the initial phase of the power uprate would be performed. (Edwards, Tr. 555-57; DX 185 at 9206). Similarly, in an April 1998 presentation, Mr. Edwards indicated that the “CCW upgrade [would be performed] to accommodate power uprate impacts.” (Edwards, Tr. 557-59; PX 90 at 9231).

In December 1998, Mr. Edwards stated “the existing CCW system [was] adequate for near-term operation until power uprate is implemented.” (Edwards, Tr. 559-60; DX 206 at 4846).

Based upon the evidence, the Court finds that the opening of the Harris C and D spent fuel pools was the least important of three reasons for the CCW upgrades. The Court therefore concludes that CP&L likely would have performed the CCW upgrades because of the power uprate and steam generator replacement, even if DOE had begun accepting spent fuel at the Harris plant on January 31, 1998. Accordingly, Plaintiffs’ claim for the CCW upgrade expenses, \$1,166,640, is denied.

8. Crystal River Re-rack Program

Plaintiffs claim \$4,675,392 as the cost to perform a re-rack operation at FPC’s Crystal River, Florida nuclear plant. The issue is whether FPC incurred this expense due to DOE’s failure to begin accepting spent fuel on January 31, 1998, or whether FPC performed the re-rack operation for a different reason, to resolve a “Boraflex degradation” problem. To grant Plaintiffs’ claim, the Court must find that DOE’s material breach in failing to accept spent fuel was a substantial causal factor in FPC’s decision to perform the re-rack operation.

“Boraflex” is a soft-rubber neutron absorbing material used to control criticality in spent fuel pools. (Maret, Tr. 1798-1801). Impregnated in the Boraflex rubber material is boron carbide, which acts as a neutron absorber, and silicon dioxide, which acts as a filler. Id. FPC discovered that Boraflex is subject to degradation following exposure to high levels of gamma radiation. (Maret, Tr. 1801-02; DX 307 at 11 n.25). When Boraflex breaks down into its constituent materials, boron carbide and silicon dioxide (silica) can leach into the spent fuel pool. Id. The Boraflex degradation causes problems relating both to criticality and silica contamination. The loss of boron reduces the ability of the racks to absorb neutrons, and the silica is a contaminant that can find its way into the reactor vessel or other systems within the plant. (Maret, Tr. 1802; Lehmann, Tr. 1126). Silica contamination is a threat to the fuel cladding, which serves as the principal barrier to release of radiation into the environment. (Maret, Tr. 1804-05; DX 307 at 11). FPC’s fuel vendor imposed silica concentration limits on the reactor coolant system to limit damage to the fuel that it had supplied and warranted. (Maret, Tr. 1805-06).

In 1995, FPC first suspected that it had a Boraflex degradation problem. (Lehmann, Tr. 1111). In a November 1996 silica assessment report, an FPC team recommended that “[r]emoval of the silica contamination – the Boraflex from the racks, or replacement of the racks would provide the optimum solution.” (PX 72 at 3355). FPC’s only concern with replacing the racks was that it might not be cost-effective. (Lehmann, Tr. 1117). FPC had received estimates that a re-rack operation would cost between \$7 and \$8 million.

(Lehmann, Tr. 1117-18; PX 72 at 3349). FPC considered other solutions to the Boraflex degradation problem, such as a reverse osmosis method, taking credit for soluble boron, or using a device known as a “racksaver.” (Lehmann, Tr. 1127-28, 1157-58, 1166-70; Culver, Tr. 937; DX 182 at 9512). These alternative solutions were less costly than re-racking, but were considered “band-aid” solutions. (Lehmann, Tr. 1169-70).

In December 1996, FPC notified the Westinghouse Corporation, the manufacturer of the racks in the spent fuel pool, that plant modifications would be necessary to manage anticipated silica levels. (Lehmann, Tr. 1118-20; DX 159). FPC believed that Westinghouse was responsible for the Boraflex degradation problem occurring in the racks. (Lehmann, Tr. 1124). FPC and Westinghouse ultimately negotiated a re-rack solution for \$3.2 million, much lower than FPC’s original \$7-8 million estimate. (PX 87 at 3532-33). Westinghouse offered a discount of approximately \$1 million for this project, where in negotiations FPC had complained about the degradation of the original Boraflex racks. (Lehmann, Tr. 1197-98, 1209). FPC obtained 117 additional storage spaces from the re-rack operation. (Lehmann, Tr. 1201-02).

Of particular significance is a December 1997 FPC Request for Project Approval (“RPA”). (DX 182). In this document, Mr. Lehmann completed a questionnaire and scoresheet of reasons for performing the re-rack operation. *Id.* at 9515-16. FPC’s company policy and instructions for completing the questionnaire are found in the “Integrated Planning Manual, Revision 5.” (PX 166). The instructions provide 36 potential questions for consideration, and guidance on a scoring system of 1-10 for each question. *Id.* at 6357-64. The preparer is required to respond only to relevant questions, which in the case of the re-rack project were Question nos. 23, 28, 29, and 35. (DX 182 at 9515-16). In answering these questions, Mr. Lehmann awarded only six of 28 total points for anything having to do with additional on-site storage. (Lehmann, Tr. 1173-88). The majority of the points, and the driving reasons for the re-rack project, were to resolve the Boraflex degradation and the silica contamination problems. The assignment of even six points may have been exaggerated, because Mr. Lehmann based the score on an assumed four years of additional storage space, but he indicated elsewhere in the same report that full core reserve could be maintained for three additional years. (Lehmann, Tr. 1183-85). For three years of additional space, the score would have been four points, not six. (Lehmann, Tr. 1182-83).

Based upon all the evidence, the Court concludes that the Crystal River re-rack project did provide additional storage space for spent fuel, but that FPC most likely would have performed this project in any event absent DOE’s breach. The re-rack decision became a cost-effective solution to the Borax degradation and silica contamination problems once Westinghouse lowered its price. The Court cannot say that DOE’s failure to accept spent

fuel at Crystal River beginning January 31, 1998 was a substantial causal factor for the re-rack project. Accordingly, Plaintiffs' claim for the cost of this project, \$4,675,392, is denied.

9. Manual Journal Entries

After examining Progress Energy's accounting records during the Court-ordered review process, Defendant agreed that Plaintiffs supported \$90,684,002 of their claimed costs with reliable documentation and evidence. Defendant contends, however, that Plaintiffs failed to support the remaining \$345,701 of their claim with adequate detail or documentation. (DX-D5 at 42-43; Johnson, Tr. 2013-14; Calvello, Tr. 1597). Plaintiffs admit that this portion of their claim is not supported with particular documentation such as an invoice, but maintains that they have met their burden of proof through witness testimony explaining how the manual adjustments were entered and why they are accurate and reliable. Pls.' Post-Trial Brief at 73.

The items in question are manual journal entries to correct mistakes, such as labor or materials inadvertently billed to the wrong project or account. (Edwards, Tr. 420). These entries do not have the same level of documentary support as the other costs comprising Plaintiffs' claim. Without documentation, Plaintiffs could not explain why particular costs were incurred, what they were for, or whether they would have been incurred absent the breach. (DX 308 at 21). The mere offering of corrected journal entries, without more, does not satisfy Plaintiffs' burden where the entries are challenged by Defendant. These costs, totaling \$345,701, must be removed from Plaintiffs' damages as unsupported. (Johnson, Tr. 2017-18; DX 308 at 21; DX-D5 at 44).

10. DOE Cask Loading Absent the Breach

In addition to challenging ten specific costs on causation and certainty grounds, Defendant claims the damages award should be reduced by \$9,818,462 for the "avoided" cost of loading DOE casks. Def. Br. at 154-56; (Johnson, Tr. 1968; DX-D5 at 43). Defendant did not cite to a single case in support of its position in its post-trial brief, and dropped the argument entirely in its post-trial reply brief. The Court can only guess that this is because the Court has uniformly rejected Defendant's proposed cask loading reduction in its previous spent nuclear fuel decisions. See Sys. Fuels, Inc., 79 Fed. Cl. at 70-71; Sys. Fuels, Inc., 78 Fed. Cl. at 797; N. States Power Co., 78 Fed. Cl. at 468-69; Pac. Gas & Elec. Co., 73 Fed. Cl. at 416; Sacramento Mun. Util. Dist. v. United States, 70 Fed. Cl. 332, 372 (2006); Tennessee Valley Auth., 69 Fed. Cl. at 542. Defendant has not provided any compelling reason why the Court should depart from this well established precedent, and the Court finds that its predecessors' reasoning applies with equal force to the present facts.

It is true that under the terms of the Standard Contract, Plaintiffs must bear the cost of loading DOE transportation casks when DOE arrives to accept its spent fuel. (PX 10 at 6850; Edwards, Tr. 388). It is also true that “[b]ecause DOE has not yet begun accepting fuel, Progress Energy has to date not incurred any costs associated with loading to DOE.” Def.’s Post-Trial Brief at 100 (citing Edwards, Tr. 572). Plaintiffs, however, have not avoided the cost of loading DOE casks. The loading costs have merely been deferred. Sys. Fuels, Inc., 78 Fed. Cl. at 797 (“[C]ask loading costs are more accurately characterized as deferred costs rather than avoided costs.”); Pac. Gas & Elec. Co., 73 Fed. Cl. at 416 (holding that plaintiff’s loading costs were deferred and not avoided); (Edwards, Tr. 388-89; Johnson, Tr. 2021; Maret, Tr. 1904-05). When DOE arrives to pick up Plaintiffs’ spent fuel in the future, Progress Energy will have to pay the loading costs that Defendant now seeks to impose. See id. The Court sees no reason why Progress Energy should have to pay twice for the same performance. See Restatement (Second) of Contracts § 347(c), cmt. d; Corbin on Contracts § 57.10.

Even if Plaintiffs’ loading costs were avoided and not deferred, Defendant failed to present any evidence showing with reasonable certainty what Plaintiffs’ loading costs would have been had DOE performed. To calculate the number of “avoided” loadings, Defendant’s expert, Gregory Maret, “assumed” that Progress Energy would load 75-ton IF 300 casks at Brunswick, Harris, and Robinson, and GA-4 truck casks at Crystal River. (DX-D4 at 22; Maret, Tr. 1817-24). Mr. Maret then made what he considered reasonable assumptions about the costs associated with those loadings. (Maret, Tr. 1824-26). Mr. Maret’s assumptions, while possibly reasonable, are contradicted by the evidence. When DOE does arrive to pick up fuel, it can choose from several types and sizes of casks, from “smaller truck weight casks” to larger 100-ton rail casks. (Maret, Tr. 1820-21). Currently, DOE has not identified the type or size of cask that it will use at Progress Energy’s plants. (Edwards, Tr. 389; Zabransky, Tr. 1527). Nor has DOE agreed to accept without repacking the already loaded dual purpose casks at Robinson, (Edwards, Tr. 389). Indeed, DOE has not committed to using railroad casks at all. Id. Given the uncertainties surrounding both the method and cost of hypothetical loading of DOE casks absent the breach, the Court finds that Mr. Maret’s assumptions do meet the standard for reasonable certainty required under the law. See Sys. Fuels, Inc., 79 Fed. Cl. at 71 (“Prior decisions have concluded that ‘[a]s matters now stand, any benefit inhering in [the utility] because of delayed loading costs would be entirely speculative. It is not possible to ascertain the method DOE will ultimately use for SNF acceptance.’”) (quoting Tennessee Valley Auth., 69 Fed. Cl. at 542); N. States Power Co., 78 Fed. Cl. at 468-69; Sys. Fuels, Inc., 78 Fed. Cl. at 797 (“[C]ask loading costs are more accurately characterized as deferred costs rather than avoided costs.”); Pac. Gas & Elec. Co., 73 Fed. Cl. at 416 (holding that given the speculative nature of the future costs, “the court declines to engage in a guessing game as to whether such deferred costs will have increased or decreased by the time (if ever) defendant performs the parties’ Standard Contract”);

Sacramento Mun. Util. Dist., 70 Fed. Cl. at 372 (declining to deduct speculative loading costs); Tennessee Valley Auth., 69 Fed. Cl. at 542 (“[B]oth DOE and [plaintiff] contemplate that DOE will still perform under the contract at some future date. As matters now stand, any benefit . . . because of delayed loading *costs* would be entirely speculative.”). For these reasons, Defendant did not meet its burden to show costs that Progress Energy avoided by not having to perform. Defendant’s proposed \$9,818,462 reduction is rejected.

11. AFUDC

Plaintiffs claim as damages a charge for an Allowance for Funds Used During Construction (“AFUDC”), the amount of which represents the “estimated debt and equity costs of capital funds necessary to finance the construction of new regulated assets.” (Edwards, Tr. 588; DX 268 at 63). Defendant argues that this cost should not be recoverable because it is the functional equivalent of interest on a claim, and is not allowable in claims against the Government in the absence of a waiver of sovereign immunity.

Under 28 U.S.C. § 2516(a), a party may not recover interest upon a claim against the United States in the Court of Federal Claims unless specifically permitted by contract or statute. As Defendant correctly points out, no provision of the Standard Contract, nor the NWPA or any other act of Congress, provides for the payment of interest on damages claims. Def.’s Post-Trial Brief at 163 (citing Maine Yankee Atomic Power Co. v. United States, 225 F.3d 1336, 1340 (Fed. Cir. 2000)).

Plaintiffs attempt to escape this rule by characterizing AFUDC as “interest *as* a claim” rather than “interest *on* a claim.” Pls.’ Post-Trial Reply Brief at 41 (emphasis in original). In support, Plaintiffs point out that AFUDC is “calculated in real time and applied contemporaneously with the project.” Pls.’ Post-Trial Brief at 70 (citing Edwards, Tr. 403). Plaintiffs rely upon Wickham Contracting Co. v. Fisher, 12 F.3d 1574 (Fed. Cir. 1994), for the proposition that “a contractor may recover interest actually paid on funds borrowed because of the government’s delay in payments and used on the delayed contract.” Pls.’ Post-Trial Brief at 71 (quoting Wickham, 12 F.3d at 1582). Defendant responds that Wickham is inapplicable to the facts here because the contract in Wickham involved the “Changes” clause which authorized recovery of interest to address a contract change. Def.’s Post-Trial Brief at 165. Moreover, Defendant argues, “[t]he changed work must be directly traced to a specific loan or necessity for increased borrowing must be shown to have been required by extra work or delay caused by the Government.” Def.’s Post-Trial Brief at 166 (quoting Gevyn Constr. Corp. v. United States, 827 F.3d 752, 754 (Fed. Cir. 1987)); see also Pls.’ Post-Trial Brief at 71 (admitting that under Wickham, they must show that “borrowed funds were used in connection with the . . . project.”) (quoting Wickham, 12 F.3d at 1583).

The Court finds it unnecessary to decide whether Wickham applies to a contract that does not contain the Changes clause because Plaintiffs failed to provide any evidence tying any borrowed money to specific projects. The record shows that Progress Energy borrowed money at the company level and not at the project level. (Edwards, Tr. 591-92). Consequently, there is no direct “one-to-one correspondence” between any borrowing and any particular breach-related project. (Edwards, Tr. 591-92). While this capital structure may, as Plaintiffs contend, be commercially reasonable and conform with Federal Energy Regulatory Commission (“FERC”) requirements, the absence of any evidence establishing a direct causal connection between the cost of borrowing and specific breach-related projects renders Plaintiffs’ \$1,996,045 AFUDC claim not recoverable. See Sys. Fuels, Inc., 79 Fed. Cl. at 69 (“Failing to have established that its claimed financing costs are directly related to required borrowing through specific debt instruments, [plaintiff] cannot recover its costs of capital.”); N. States Power Co., 78 Fed. Cl. at 471-72 (“Absent proof of any borrowings with which the interest claim can be causally identified, however, plaintiff’s cost of capital damages become conceptually indistinguishable from prejudgment interest, *i.e.*, interest on a claim.”). (DX-D5 at 43).

Conclusion

Based upon the foregoing, the Court awards damages to Plaintiffs for \$82,845,926 through December 31, 2005. The Clerk is directed to enter judgment for Plaintiffs in this amount. Pursuant to Rule 54, costs are awarded to Plaintiffs.

IT IS SO ORDERED.

s/Thomas C. Wheeler
THOMAS C. WHEELER
Judge