

In the United States Court of Federal Claims

Case No. 04-0109C
(FILED: June 3, 2010)
TO BE PUBLISHED

**SOUTHERN CALIFORNIA EDISON
COMPANY,**

Plaintiff,

v.

THE UNITED STATES OF AMERICA,
Defendant.

* Nuclear Waste Policy Act of 1982;
* Standard Contract for disposal of
* spent nuclear fuel and high-level
* waste; partial breach of contract;
* damages in mitigation; causation,
* foreseeability and reasonable
* certainty of damages; contractually
* required rate of acceptance;
* acceptance of Greater-Than-Class-C
* radioactive waste; damages not
* incremental to breach; avoided
* versus deferred costs; risk of
* uncertainty caused by breach;
* recovery of overhead; Private Fuel
* Storage initiative; Allowance for
* Funds Used During Construction.

Brad Fagg, Washington, DC, with whom were **Paul M. Bessette** and **D. Bruce McPherson**, for Plaintiff.

Lisa L. Donahue, U.S. Department of Justice, Civil Division, Commercial Litigation Branch, Washington, D.C., with whom were **Harold D. Lester, Jr.**, Assistant Director; **Jeanne E. Davidson**, Director; and **Michael F. Hertz**, Acting Assistant Attorney General; **Marian E. Sullivan**, **Christopher J. Carney**, and **Seth W. Greene**, U.S. Department of Justice, and **Jane K. Taylor**, U.S. Department of Energy, for Defendant.

John Bergen, law clerk.

OPINION

BASKIR, Judge.

On April 20-28, 2009, this Court heard evidence on the plaintiff's damages stemming from the Federal Government's failure to discharge its contractual obligation under the Standard Contract entered into between the Department of Energy (DOE) and the plaintiff utilities to begin acceptance and permanent storage of spent nuclear fuel (SNF) and High Level Waste (HLW). The plaintiff, Southern California Edison Company (SCE), has claimed \$146,349,316 in damages.

The Court concludes that plaintiff is entitled to a total of \$142,394,294 in damages, broken down roughly into the following categories: (1) approximately \$92 million for construction and operation of an on-site dry storage facility, or Independent Spent Fuel Storage Installation (ISFSI), for each of its reactors; (2) approximately \$23.6 million in overhead allocated to the ISFSI project; and (3) \$26.8 million in expenses incurred storing SNF off-site.

The trial record consists of the testimony of 12 witnesses and approximately 350 exhibits. The plaintiff presented the testimony of the following individuals, each a current or former employee of SCE at its San Onofre Nuclear Generating Station (SONGS):

- James Reilly, former Vice President of Engineering and Technical Services at SONGS;
- Paul Myers, who held various management positions at SCE and was responsible for nuclear fuel management and storage;
- Jorge Morales, a construction engineer with a long work history at SCE, including various project manager and corporate positions;
- Torrey Yee, a consulting engineer who worked on SONGS plant modifications and transshipment strategies aimed at increasing SNF storage capacity; and
- David Cowell, a budget analyst and lead cost engineer on the SONGS Unit 1 decommissioning project.

The defendant presented four fact witnesses and three expert witnesses, as follows:

- Christine Gelles, a DOE witness from the Office of Environmental Management who provided testimony on concentrations of Greater-Than-Class-C (GTCC) waste in the nuclear industry;
- Dena Berkin, a project manager for SCE who testified pursuant to subpoena concerning the company's corporate accounting systems, particularly in regards to overheads;
- Kimberly Murray, another subpoenaed SCE witness, who had served as a budget manager for SONGS operations and maintenance budget;
- David Zabransky, the Chief Operating Officer for DOE's Office of Civilian Radioactive Waste Management (OCRWM) and the contracting officer for the Standard Contract between DOE and the nuclear utility industry;
- Sander Levin, an engineering consultant who offered opinion testimony regarding certain technical aspects of SCE's mitigation response;
- Dr. Jonathan Neuberger, an economic modeling expert who has testified on behalf of the government in several SNF cases; and
- R. Larry Johnson, an accounting expert who, like Dr. Neuberger and Mr. Zabransky, has provided similar testimony in previous SNF trials.

There have been over 70 cases brought by the nuclear electric utility industry in connection with DOE's failure to perform under the Standard Contract. The intricate background of this contractual undertaking has been addressed extensively in previous decisions of this Court and the United States Court of Appeals for the Federal Circuit. Accordingly, we offer only an abbreviated history of the government's nuclear waste disposal program and the breach which resulted in the filing of this claim by SCE.

The matters addressed below comprise, for the most part, general litigation history and uncontradicted background data – the source for the latter category being the Joint Stipulations filed prior to trial. Any factual assertions constitute the findings of the Court unless otherwise modified in the subsequent discussion.

The Standard Contract

Pursuant to the Nuclear Waste Policy Act of 1982 (NWPA), Pub.L. 97-425, 96 Stat. 2201 (codified as amended, 42 U.S.C. §§ 10101-10270), DOE entered into identical contracts with all commercial nuclear utilities. The utilities were required to execute the Standard Contract as a prerequisite to obtaining renewal of their operating licenses. *Ind. Mich. Power Co. v. United States*, 422 F.3d 1369, 1372 (Fed. Cir. 2005). The plaintiff executed its contract with DOE on June 10, 1983. Joint Exhibit (JX) 2. Under the terms of the contract, which is codified at 10 C.F.R. § 961.11, the utilities – referred to as “Purchasers” – were to make payments to a Nuclear Waste Fund while they continued to operate pursuant to various licensing requirements. In exchange, DOE promised to accept spent nuclear fuel (SNF) and high-level waste (HLW) generated by the utilities as a byproduct of providing electricity for their customers. DOE was contractually bound to accept the SNF and HLW for permanent disposal beginning no later than January 31, 1998. Standard Contract, art. II.

In 1987, Congress amended the NWPA and directed that the repository be located inside Yucca Mountain, Nevada. 42 U.S.C. § 10172 (a)-(b). After a number of delays, however, DOE announced in 1994 that operations at the proposed repository in Yucca Mountain would commence no earlier than 2010. Notice of Inquiry, 59 Fed. Reg. 27, 007-02 (May 25, 1994); *see also*, 60 Fed. Reg. 21, 793; 21, 794 (May 3, 1995). In any event, January 31, 1998, the date DOE was to commence performance, came and went with the defendant unable to accept SNF or HLW because the government had yet to build a permanent geologic repository for these hazardous wastes.

In the face of further hurdles, DOE subsequently revised its estimate to 2020. Tr. at 1112-13, 1148-49. However, in 2009, the President cut funding for the Yucca Mountain project entirely from the then current budget. Without funding, DOE would not be able to proceed beyond the licensing application phase of the project, at best. *Id.* at 1149-51.

On March 3, 2010, DOE filed a motion with the Nuclear Regulatory Commission (NRC) seeking to withdraw its application for a license to operate the Yucca Mountain repository less than two years after the application was filed. See DOE's Motion to Withdraw, *In the Matter of DOE (High-Level Waste Repository)*, Docket No. 63-001 (NRC Mar. 3, 2010). The request was made "to provide finality in ending the Yucca Mountain project for a permanent geologic repository," according to the motion. See *id.* at 3 (DOE requested that its application be dismissed with prejudice "because it does not intend ever to re-file an application to construct a permanent geologic repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain.") At the same time at least two states, South Carolina and Washington, have sued to preserve the Yucca Mountain project. Nonetheless, as a practical matter the Yucca Mountain proposal is dead, there are currently no alternate plans for a repository, and the government cannot perform under the Standard Contract.

In April 2010, a group of nuclear utilities and other plaintiffs filed suit in the U.S. Court of Appeals for the District of Columbia Circuit seeking to halt the collection of fees mandated by the Standard Contract for the construction and operation of the now defunct Yucca Mountain repository. See Joint Petition for Review, *Nuclear Energy Inst. v. United States Dep't of Energy*, No. 10-1076 (D.C. Cir. Apr. 5, 2010) (Plaintiff, Nuclear Energy Institute, is joined by sixteen public utilities, not including SCE, which have SNF cases pending in COFC); see also Petition for Review, *Nat'l Ass'n. of Regulatory Util. Comm'rs v. United States*, No. 10-1074 (D.C. Cir. Apr. 2, 2010). Nonetheless, we continue to operate under the legal fiction that there has only been a partial breach, and that the government will be able to perform sometime after 2020.

As a result of the government's failure to perform, utilities had to store SNF and HLW in order to sustain their normal operations. Due to the hazardous nature of the materials and the regulated environment in which the utilities operate, they were forced to find storage alternatives. See *Ind. Mich.*, 422 F.3d at 1375 ("It is beyond debate that because the government unequivocally announced in 1994 that it would not meet its contractual obligations beginning in 1998, the utilities were in fact obligated to take mitigatory steps.") For the most part, the utilities continue to function, although a number of SNF cases involve utilities which have altogether ceased operations. See Tr. at 1049 (Among the 118 nuclear power reactors covered by the Standard Contract, 104 are operating reactors.) SCE continues to operate 2 of its 3 reactors at SONGS, and is licensed to do so for another twelve years. It has treated DOE's delay as a partial breach of contract, mitigated against the delay, and continues to perform its end of the contract – SCE has paid approximately \$375 million in fees pursuant to the Standard Contract and currently pays \$4 million per quarter – with the expectation that the government will ultimately discharge its obligations. Tr. 226-27 (Myers); see also, Tr. 1112 (Zabransky).

Liability on the part of DOE has been conclusively established – the U.S. Court of Appeals for the Federal Circuit has held that DOE breached the Standard Contract by failing to commence accepting SNF by January 31, 1998. *Carolina Power & Light Co. v. United States*, 573 F.3d 1271, 1273 (Fed. Cir. 2009) (“*Carolina Power II*”); *Maine Yankee Atomic Power Co. v. United States*, 225 F.3d 1336, 1343 (Fed. Cir. 2000). However, the proper measure of damages has proven elusive due to conflicting interpretations of the contractual acceptance rate.

Oldest Fuel First

Not all utilities were to have their SNF picked up on the same date. One of the guiding principles of the Civilian Radioactive Waste Management Program, as set forth in the Standard Contract, is what the parties have dubbed the oldest fuel first (OFF) rule. Under this policy, utilities will receive annual allocations for SNF removal based on how long their radioactive wastes have cooled (SNF must cool in a spent fuel pool for at least 5 years before being removed for temporary or permanent storage). The terms of the Standard Contract provide for DOE to issue an acceptance priority ranking (APR) annually, beginning in April 1991, in order to project where a specific allocation of SNF falls in the acceptance queue for the entire nuclear utility industry. Standard Contract, art. IV(B)(5)(a).

Pursuant to the OFF scheme, acceptance priority “shall be based upon the age of the SNF and/or HLW as calculated from the date of discharge of such material from the civilian nuclear power reactor.” *Id.* at art. IV (B)(5)(a). Subject to certain adjustments and exchanges, “DOE will first accept from Purchaser the oldest SNF and/or HLW for disposal in the DOE facility.” *Id.* at art. VI (B)(1)(a).

Acceptance Rate

The Standard Contract was silent on the acceptance rate for SNF. Instead, the agreement contemplated that DOE would issue, not later than July 1, 1987, an annual capacity report (ACR), which is essentially a 10-year planning document to determine how much SNF could be accepted from a source in a given year. *Id.* at art. IV (B)(5)(b). The ACR factors in the department’s annual receiving capacity and the acceptance ranking for particular SNF generators, based on the OFF principal. *Id.* Thus, the ACR, working in conjunction with the APR, determines the DOE’s acceptance capacity schedule (ACS).

As delays in achieving an operational repository mounted, the ACR was continually modified. In the relatively few SNF cases which have gone to trial on damages, the Court grappled with certain causation issues which necessarily define the scope of damages. In particular, trial courts have adopted differing damages models based on alternative holdings on the contractual rate of SNF acceptance.

Accordingly, in order to prove causation, plaintiff utilities were required to demonstrate that their fuel would have been in the queue for acceptance during the appropriate damages period. The rate of SNF acceptance, which is not spelled out in the contract, is determinative of this causation analysis. Several of our colleagues conducted damages trials in which the parties relied on several alternative acceptance rates, leaving the appropriate rate very much an open issue. Fortunately, that issue was put to rest on August 7, 2008, when the Court of Appeals issued three decisions addressing damages. The Court ruled that DOE’s acceptance rate was dictated by the department’s initial planning document, the June 1987 ACR. See *Pacific Gas & Elec. Co. v. United States*, 536 F.3d 1282, 1292 (Fed. Cir. 2008) (“*PG&E II*”) (“[T]he 1987 report is an ACS report that contemplated full and timely performance. Thus, this report presents the most reasonable measure of the contractual acceptance rate.”); *Yankee Atomic Electric Co. v. United States*, 536 F.3d 1268, 1274 (Fed. Cir. 2008) (“*Yankee II*”) (following *PG&E II*); *Sacramento Mun. Util. Dist. v. United States*, 293 Fed. Appx. 766, 771 (Fed. Cir. Aug. 7, 2008) (“*SMUD II*”) (same). The 1987 ACR rate, which was derived from DOE’s June 1987 OCRWM Mission Plan Amendment, now controls all SNF damages calculations, at least for the first ten years of performance.

Pursuant to the 1987 ACR, DOE was required to accept SNF in the following amounts, expressed in terms of metric tons of uranium (MTU) in accordance with the timetable below:

<u>Year</u>	<u>Receipt Rate (MTU)</u>
1998	1,200
1999	1,200
2000	1,200
2001	1,200
2002	1,200
2003	2,000
2004	2,650
2005	2,650
2006	2,650
2007	2,650

Plaintiff’s and Defendant’s Joint Stipulations (“Joint Stip.”) ¶ 4; see 1987 ACR at Table 2.1 (Illustrative Waste Acceptance Schedule for the First 10 Years of Facility Operation) (JX 4).

We will discuss the acceptance rate and other provisions of the Standard Contract in more detail as they relate to specific elements of SCE's claim.

SCE's Operations

SONGS is operated by SCE subject to the terms of the Standard Contract. The station, which generates power for customers throughout the region, is located on Camp Pendleton Marine Corps Base on the coast of southern California. The plaintiff leases the property from the Department of the Navy. The SONGS facility is comprised of three individual nuclear plants. SONGS Unit 1 began operations in 1967 and has since been decommissioned. SONGS Units 2 and 3 commenced operations in August 1983 and April 1984, respectively, and continue to generate electricity. Their operating licenses, issued by the NRC, expire in 2022. Joint Stip. ¶¶ 5-7.

Plaintiff's nuclear energy capabilities come from radioactive uranium pellets aligned within long fuel rods, bundled into an array of "assemblies." *Id.* at ¶ 8. The assemblies provide energy for a finite period of time. Once the uranium fuel rods approach the end of their useful life, the assemblies are removed and replaced with new ones that generate heat and electricity more efficiently. *Id.* at ¶ 9. The "spent nuclear fuel" assemblies are extremely radioactive and, therefore, must be properly treated and stored until accepted by DOE for permanent disposal under the Standard Contract. *Id.*

The SONGS 2 and 3 reactor cores have the capacity to hold up to 217 fuel assemblies each. *Id.* at ¶ 10. Plaintiff refuels the SONGS Unit 2 and 3 reactors every two years, swapping out approximately 100 of the 217 assemblies in each unit. *Id.* at ¶ 9. During refueling operations, spent fuel assemblies are submerged and cooled in on-site spent fuel pools adjacent to the reactor, where they remain stored vertically in racks within the pools for at least five years. *Id.* at ¶¶ 9-11; 14. They remain in this "wet storage" state – known as SAFSTOR condition – until shipped offsite, removed to dry storage, or disposed of by DOE. *Id.* at ¶ 9.

The SONGS 1 spent fuel pool was relatively small – it stored a maximum of 216 SNF assemblies. The SONGS 2 and 3 pools hold up to 1,542 assemblies each. *Id.* at ¶¶ 13-14. It is standard operating procedure in the industry to maintain "full core reserve" capacity. This is the requirement that sufficient reserve space be maintained in the pool to accommodate a discharge of its full reactor core – in the case of the SONGS 2 and 3 units, 217 fuel assemblies – into each pool if necessary. Tr. 249 (Myers); Joint Stip. ¶¶ 15-16. The practice is motivated by "operational prudence," according to Mr. Reilly, SCE's representative at trial. Tr. 92. With the ability to quickly discharge an entire core, there is less downtime for the generation of electricity. If the reactor must be shutdown for any reason, it is imperative to place the radioactive assemblies in the pools. Therefore, the available wet storage for SNF is effectively reduced from 1,542 assemblies to 1,325 assemblies each for SONGS 2 and 3. Joint Stip. ¶ 16.

Due to the limited space in the Unit 1 pool and the need to maintain a full core reserve, the plaintiff was required to move SNF from the SONGS 1 in order for the reactor to remain operational. A portion of the SONGS 1 SNF went to the SONGS 2 and 3 spent fuel pools, where it was stored temporarily in SAFSTOR condition. The remaining SNF assemblies were shipped off-site.

SONGS Unit 1 Fuel

A. Off-Site Storage SNF

The plaintiff shipped SONGS Unit 1 spent fuel assemblies from the West Coast to a plant operated by General Electric in Morris, Illinois, to be reprocessed. Between 1974 and 1976, SCE shipped 99 fuel assemblies to GE Morris. *Id.* at ¶ 20. Prior to commencing any reprocessing activities, however, the reprocessed spent nuclear fuel program was indefinitely suspended by President Carter. *Id.* at ¶ 21. Although President Reagan later lifted the suspension, commercial spent fuel reprocessing has not been undertaken in the United States. *Id.* As this program was being considered by successive administrations, SCE made arrangements with GE Morris to store the previously delivered assemblies, and shipped additional assemblies, bringing the total number of stored assemblies to 270. *Id.* at ¶ 22; Tr. 246-47.

The plaintiff claims no damages associated with the original shipment of SNF to the GE Morris facility. Tr. 250. However, SCE has incurred the costs of storing that SNF – the “oldest” of SCE’s spent fuel – at the off-site facility well beyond the anticipated acceptance period. Plaintiff entered into a Nuclear Fuel Storage Contract with GE Morris in 1987, whereby SCE agreed to pay a monthly base storage charge of \$800 per month, per assembly, plus other related costs. Joint Stip. ¶ 23; Plaintiff’s Exhibit (PX) 8. The storage arrangement was tied to the projected date for the last of these stored assemblies to be received by DOE for permanent storage under the department’s nuclear waste disposal program, and was originally set to expire May 31, 2002. Joint Stip. ¶ 23. As a result of DOE’s continuing delay, SCE and GE Morris have twice amended the contract, once on April 11, 2002, and again on November 30, 2006, extending the expiration to May 31, 2022. *Id.*

B. Decommissioning and On-Site Storage of SNF and HLW

Ultimately, in the mid-to-late 1980's, SCE had to halt its shipments to GE Morris due to the absence of authorized transportation routes, at which time it began “transshipping” casks of SNF from SONGS Unit 1 to the larger spent fuel pools at Units 2 and 3. Tr. 94; 97 (Reilly). Soon thereafter SCE began the process of decommissioning SONGS Unit 1 rather than embark on expensive upgrades that would be required to maintain operations at the plant. Tr. 97-98.

Therefore, in addition to the 270 assemblies transported to GE Morris during the late-1970's and early-1980's, SCE was compelled to come up with storage solutions for the fuel removed from the Unit 1 reactor once SCE suspended operations in November 1992. Joint Stip. ¶ 25. Although the SNF is removed from the reactor during the decommissioning process, the Unit 1 spent fuel pool remained intact, in SAFSTOR status, pending full decommissioning. Tr. 98. SCE placed 207 fuel assemblies from the Unit 1 reactor into the SONGS Unit 1 spent fuel pool. Additional assemblies were transhipped to the Unit 2 and Unit 3 pools. By late 1993, the SONGS Unit 2 pool contained 70 assemblies of Unit 1 SNF; the SONGS Unit 3 pool contained 118 of the Unit 1 assemblies. Joint Stip. ¶¶ 26-28.

The plaintiff commenced with the SONGS Unit 1 decommissioning plans in 1999. Before fully dismantling the unit, SCE had to remove the SNF from the Unit 1 spent fuel pool. *Id.* at ¶¶ 29-30. At this point, of course, the DOE had failed to comply with the deadline for commencing performance under the Standard Contract. Consequently, SCE was compelled to address storage concerns before taking the reactor offline. Complicating matters further, SCE had to deal with the ensuing GTCC. When the nuclear reactor is dismantled, the debris from the reactor core and other components which have been exposed to radioactivity result in GTCC waste. This is defined by the NRC as material that has certain radionuclide concentrations above the Class C limits for Low Level radioactive wastes. 10 C.F.R. § 61.55; Joint Stip. ¶ 18. The GTCC waste accumulated from the dismantled Unit 1 reactor was stored temporarily in the Unit 2 and Unit 3 spent fuel pools. Joint Stip. ¶ 17. In order for Units 2 and 3 to remain operational, however, SCE had to find another storage solution for the SNF and GTCC from the decommissioned SONGS 1 reactor.

Dry Storage and Other Attempts to Mitigate Damages

When DOE did not begin accepting SNF in 1998, the agency breached the Standard Contract. As the Court of Appeals has held, DOE's "breach involved all the utilities that had signed the contract – the entire nuclear electric industry." *Maine Yankee*, 225 F.3d at 1342. However, all parties to the contract were well aware, long before the 1998 acceptance deadline arrived, that DOE would not have an operational permanent repository for SNF in time to begin disposing of SNF on schedule. Consequently, the plaintiff was faced with the certainty that it would not be able to maintain full core reserve in its active reactors – SONGS Units 2 and 3 – unless it came up with a means of cycling the cooled SNF and HLW, including GTCC, out of its pools to make room for newly discharged radioactive assemblies.

During the 1991-1992 time frame, SCE began to analyze its SNF storage needs for SONGS Units 2 and 3. PX 19. In the absence of steps to mitigate against DOE's failure to accept plaintiff's SNF and HLW, SCE determined that it would soon lose full core reserve capacity, which, in turn, would require the company to suspend operations. The company considered fuel consolidation and dry storage as the principal storage options.

The plaintiff also made a foray into another, less certain alternative. In 1994, SCE joined a consortium of utilities formed to develop and manage a temporary storage facility for SNF at an undetermined site. The utilities formed a limited liability corporation known as the Private Fuel Storage (PFS) project. Joint Stip. ¶ 46. The trial revealed little in the way of specifics on PFS. We know that the project hinged on a successful partnership with certain Indian tribes for the use of tribal lands in Utah upon which to build and operate a suitable storage facility. *Id.* Utilities paid membership fees in the hopes that one day PFS would emerge as a solution for DOE's tardy performance. *Id.* A select few of the utilities affected by DOE's breach went one step further and invested as equity partners in the venture. The plaintiff became an equity partner, and initially had a 12.5 percent share in PFS. Tr. 324. According to the undisputed record of plaintiff's expenditures, SCE spent over \$2 million in pursuit of the PFS project. Joint Stip. ¶ 47; PX 140. We discuss PFS in more detail below.

The principal SCE mitigation effort, however, was directed at establishing effective on-site dry storage. According to SCE's 1992 study results, dry storage had proven to be a dependable cost effective method. PX 19. In order to ensure timely cycling of SNF and HLW out of the spent fuel pools and to maintain full core reserve, SCE began constructing the ISFSI complex at SONGS in 2001. Joint Stip. ¶ 31. The ISFSI consists of a seismically designed steel reinforced concrete pad; a fenced facility within the SONGS plant with various security features; seismically designed reinforced concrete Advanced Horizontal Storage Modules (AHSM); and seismically designed Dry Storage Canisters (DSC) that accommodate up to 24 spent fuel assemblies each. *Id.*

In dry storage operations, assemblies are removed from the spent fuel pools and inserted directly into a stainless steel DSC that meets certain NRC required ratings. The DSC is then placed into the concrete AHSM, which are themselves loaded and stored horizontally on the ISFSI. *Id.* at ¶¶ 32-33. We heard a substantial amount of testimony about these storage canisters and about the transportation casks that would ultimately be required to ship the SNF to Yucca Mountain. SCE manufactured the DSCs for use in its ISFSI on-site rather than use an outside vendor. *Id.* at ¶ 34.

By September 2004, the plaintiff had completed loading the assemblies stored at the Unit 1 spent fuel pool and those Unit 1 assemblies stored in the Unit 3 spent fuel pool, onto the Unit 1 ISFSI. The remainder of the Unit 1 assemblies, stored in the Unit 2 spent fuel pool, were loaded onto the ISFSI the following year. *Id.* at ¶ 35. All told, the entirety of the Unit 1 SNF – other than that which remains stored at GE Morris – is contained in 17 DSCs at the SONGS ISFSI. *Id.* at ¶ 36. As we mentioned earlier, GTCC from the decommissioned reactor was also stored in the pools. Accordingly, SCE created an additional modified DSC and AHSM for the internal reactor materials classified as GTCC. *Id.* at ¶ 37.

After the completion of the Unit 1 ISFSI, SCE constructed at the far end of the SONGS site another ISFSI serving the continuing need for dry storage at Units 2 and 3. This project has entailed the manufacture of 13 AHSMs and DSCs as of December 31, 2005. *Id.* at ¶ 41.

This trial is about the plaintiff's effort to recoup the expenses it has incurred to date because of the government's breach. In particular, SCE seeks compensation for the costs associated with removing SNF from the wet pools, packaging it in a canister and transporting it to the appropriate storage facility. The expenditures recorded in relation to both the Unit 1 ISFSI and the Units 2 and 3 ISFSI – the direct costs of constructing and operating the ISFSI, as well as other indirect costs – are addressed in detail in the discussion that follows.

Overview of Claims and Contested Matters

The plaintiff claims mitigation damages in relation to DOE's breach of the Standard Contract in the amount of \$146,349,316. Loosely broken down, the damages fall into the following categories:

- Costs of constructing and operating the on-site dry storage facility or ISFSI (\$61,981,761 for SONGS Unit 1 and \$35,551,467 for SONGS Unit 2);
- Various types of overhead allocated to the ISFSI project (\$19,544,212 for SONGS Unit 1 and \$4,113,579 for SONGS Units 2 and 3);
- Off-site storage of SNF at the GE Morris facility (\$26,827,548).
- Costs associated with plaintiff's partnership in PFS (\$2,088,656);

PX 125 (1987 ACR Claim Summary). Included within the amounts listed, above, are:

- GTCC-related storage costs and (\$1,260,771); and
- Allowance for Funds Used During Construction ("AFUDC"), representing the costs of capital (\$605,594).

The plaintiff applied an adjustment of \$3,757,908 to the above figures to account for avoided SAFSTOR costs. *Id.*

The accounting and accuracy of the dollar claim are not contested by the government. The following concession appears among the pretrial stipulations:

Pursuant to the Court's order ... SCE produced various cost and project documentation regarding its claims, which was reviewed by the government. As part of that process, the government determined that the charges included in the claim were properly recorded in SCE's general ledger systems. However, simply because a charge has been properly recorded within SCE's accounting systems does not mean that such costs are recoverable as damages in this case.

Joint Stip. ¶ 19; *id.* at ¶¶ 42-45 and 47. Among the points of contention in this trial, the government issued a blanket challenge to the recovery of otherwise due mitigation costs based on what it argues is a technically flawed demonstration of causation – the failure to consider the impact of GTCC on DOE's acceptance rates. Absent the alleged uncertainty created by the inclusion of GTCC in the acceptance queue, the government recognizes that SCE is entitled to certain damages incurred as a result of the DOE's breach.

As it has done in previous SNF trials, however, the defendant opposes certain categories of damages, either because the damages are simply not permitted by law or because SCE failed to demonstrate that the costs associated with them would not have been incurred absent the breach – so-called “non-incremental costs.” Notable among the challenged categories of damages are:

- plaintiff's claims for overhead;
- “avoided costs,” representing activities that would have been required of SCE had the government performed the contract, such as cask loading, fuel characterization, the provision of failed fuel canisters and training;
- expenditures related to the SCE's investment in PFS; and
- plaintiff's claimed allowance for funds used during construction (AFUDC).

In sum, the defendant's experts have reduced the plaintiff's damages by over \$34 million to account for non-incremental elements of SCE's damages claim, and by an additional nearly \$4 million for other elements – PFS, AFUDC and GTCC storage – they contend are not recoverable here. See Tr. 1225 (\$3,955,000 not recoverable); Defendant's Demonstrative Exhibit, (DDX) 4 at 10 and 37. Assuming causation is established, therefore, the uncontested damages amount to \$108,258,739 million. DDX 4 at 9 (Total Adjusted Damages).

The litigation of SNF claims, in general, has engaged substantial resources, both in the exceptional advocacy of the counsel involved and in the careful attention given by this Court and the Court of Appeals to these unique claims. As a result, most of the common issues have been largely decided or at least refined to the point that we can easily judge them by the imprint of those cases that have been decided before our trial.

Partial Breach of Contract

It is axiomatic in breach of contract cases that the non-breaching party is entitled to damages sufficient to place it in as good a position as it would have been had the breaching party fully performed. *Ind. Mich.*, 422 F.3d at 1373 (citing *San Carlos Irrigation & Drainage Dist. v. United States*, 111 F.3d 1557, 1562 (Fed. Cir. 1997)). SCE continues to pay \$16 million per year in quarterly fees to the Nuclear Waste Fund pursuant to the contract. By the end of 2005, SCE had paid over \$375 million into the Fund in exchange for the government's unfulfilled promises. Tr. 226-27. Nonetheless, these staggering sums are not part of plaintiff's suit for damages. Nor, interestingly, has SCE joined in the recently filed APA challenges to continued collection of the fees.

Under a partial breach scenario, "the injured party elects to or is required to await the balance of the [breaching party's] performance under the contract," and brings an interim action to recover only those damages incurred to date. *Ind. Mich.*, 422 F.3d at 1374. Indeed, as the Court of Appeals has noted, the NWPA precludes the parties from treating the government's omissions as a total breach, insofar as the DOE may not be discharged from the responsibility to dispose of SNF and HLW. *Id.* Accordingly, remedies for most SNF claimants are limited to those costs incurred pursuant to the utility's duty to mitigate damages caused by DOE's breach. *Id.* at 1375. Specifically, SCE is entitled to mitigation costs incurred by the utility up to the date of its claims. For purposes of this lawsuit the agreed upon cut-off date for damages is December 31, 2005.

It is the burden of the non-breaching party to establish that the particular damages claimed are recoverable. In sustaining this burden, SCE must demonstrate: (1) the damages were reasonably foreseeable by the breaching party at the time the contract was entered into; (2) the breach is a substantial causal factor in the damages; and (3) damages can be shown with reasonable certainty. *Id.* at 1373 (citing *Energy Capital Corp. v. United States*, 302 F.3d 1314, 1320 (Fed. Cir. 2002)).

The government does not challenge the *reasonable certainty* of the plaintiff's mitigation costs. With the exception of a small portion of the damages claim representing the utility's investment in the PFS initiative, which we address below, the government also does not dispute that SCE's expenses were *foreseeable* at the time of contracting. Tr. 38-39 (Opening Statement). The focal point of the defendant's arguments is SCE's ability to prove the *causation* element. *Id.*

Plaintiff can only recover for mitigation efforts if it is shown that these measures were incurred as a direct result of the government's breach, *i.e.*, causation. Assuming causation, the burden then shifts to the defendant. In defending against SCE's damages, the government must affirmatively establish that the mitigation was inappropriate or unreasonable. *Ind. Mich.*, 422 F.3d at 1375. The breaching party may also show that the injured party has avoided certain expenses that it would have incurred in a non-breach scenario. Under these circumstances, mitigation damages are offset by a corresponding amount in order to prevent a windfall to the plaintiff. For example, the defendant argues that SCE's damages are overstated because expenses claimed for cask-loading and other on-site storage activities would ultimately have been borne by the utility under the Standard Contract. The government argues that when DOE eventually performs its contractual obligations and accepts SCE's SNF canisters, the plaintiff will have avoided these responsibilities if reimbursed for them now.

The government has pursued these defenses in the present case, as it has in most other SNF cases tried to date. *See, e.g., Carolina Power & Light Co. v. United States*, 82 Fed. Cl. 23 (2008) (*Carolina Power I*), *aff'd in part, vacated in part, and remanded*, 573 F.3d 1271 (Fed. Cir. 2009); *Dominion Resources, Inc. v. United States*, 84 Fed. Cl. 259 (2008), *appeal docketed*, No. 09-5032 (Fed. Cir. Jan. 8, 2009); *Southern Nuclear Operating Co. v. United States*, 77 Fed. Cl. 396 (2007); *Tenn. Valley Auth. v. United States*, 69 Fed. Cl. 515 (2006).

Establishing Causation

Our focus throughout this trial is not only upon what is, but also upon what might have been. The conditions created by DOE's breach, and the costs borne by the utilities, are manifest. Any evidentiary gaps in SNF litigation pertain to the conditions that *would have existed* had the SNF disposal program gone as planned. As the Federal Circuit has observed:

Without record evidence about the [plaintiff's] condition with full government performance, the Court of Federal Claims could not perform the necessary comparison between the breach and non-breach worlds and thus could not accurately assess the [plaintiff's] damages.

Yankee II, 536 F.3d at 1273 (citations omitted).

As we have previously noted, the trio of cases decided by the Court of Appeals in the summer of 2008 – *PG&E II*, *Yankee II* and *SMUD II* – established that the DOE was obligated to accept spent fuel in accordance with the 1987 ACR.

Applying the acceptance rates set out in the 1987 ACR to its inventory of SNF, the plaintiff can calculate what amount of SNF, if any, would have been picked up by a date certain. Should the application of that rate show that DOE's pick-up obligations had

indeed been triggered by that date, then SCE can successfully demonstrate a direct correlation between the government's breach and the utility's necessity to provide unanticipated storage solutions for its SNF.

As we indicated above, SCE's safety and operating practices dictate that the utility reserve sufficient space in the spent fuel pools in order to maintain full core reserve. Joint Stip. ¶ 15; Tr. 90-92 (Reilly); Tr. 249 (Myers). By all accounts, this practice is routine in the nuclear energy industry. It is necessary in order to provide a conservative margin of error in the event active fuel assemblies need to be cooled and temporarily stored to allow for emergency repairs or routine maintenance and refueling. See *Yankee II*, 536 F.3d at 1275 (describing ideal of maintaining "sufficient pool capacity to permit discharge of all fuel assemblies from the reactor core into the pool to accommodate maintenance and repair operations.")

There is a direct causal link between DOE's failure to begin accepting SNF and the plaintiff's damages – SCE's demonstrated need to come up with alternative storage solutions in order to maintain a full core reserve. The contractual rate of acceptance, therefore, becomes critical in the causation showing. Based on the stipulated facts, and those adduced at trial, the plaintiff has met its burden.

The full core for SONGS Unit 2 and Unit 3 is 217 assemblies. Joint Stip. ¶ 16. In order to maintain full core reserve, therefore, plaintiff had to maintain 217 open rack spaces in each pool, allowing for storage of up to 1,325 SNF assemblies in each pool. Any assemblies in excess of this amount would necessarily require additional storage. *Id.*

The model SCE presented at trial sets out inventories for every year beginning in year 1995 and projected out through 2017 (although data beyond year 2005 is beyond the scope of these proceedings.) For greater ease in understanding the plaintiff's methodology, we have reprinted as an appendix to this opinion a spreadsheet summary entitled "1987 ACR Causation Analysis," which was created by the plaintiff and admitted into evidence over defendant's objection as PX 104.

The model is based on SCE's allocations under the 1987 ACR, as required by the *PG&E* trilogy. For each year, SCE provided information on the discharged assemblies and showed the growing inventory at SONGS resulting from DOE's failure to pick up SNF, both in terms of total spent fuel pool inventories as well as unavailable spaces. For each year, the plaintiff's exhibit carries forward a balance of unavailable storage space in those pools, represented on the chart as "Margin over FCR (Assemblies)." PX 104. Based on this evidence, it is clear that the government's breach necessitated SCE's mitigation activities. But for the defendant's failure to accept the plaintiff's SNF and GTCC waste, SCE would have maintained full core reserve and sustained operations without the need to resort to dry storage. See Tr. 259-60 (Myers); Tr. 131-34 (Reilly).

The defendant's experts found no flaws with SCE's causation analysis with regard to SNF alone. Tr. 1010 (Levin); Tr. 902 (Neuberger). The government provided no calculation or spreadsheet of its own, but dismissed the report as incomplete in light of the Federal Circuit's interpretation of the Standard Contract as it related to GTCC wastes. Initially, SCE made no effort to respond to the fact that GTCC had never been calculated in the queue placement/acceptance rate quotient. Thus, the causation model represented by PX 104 makes no allowance for GTCC in SCE's acceptance queue. We will address the impact of GTCC on causation shortly.

Causation Analysis Applied to SCE's Damages

Once the appropriate acceptance rate is applied, it is readily apparent that SCE could not sustain operations without making room in the spent fuel pools for additional assemblies on a continuing basis. Consequently, the plaintiff has demonstrated that the need for temporary storage was caused by the DOE's failure to accept SNF on a timely basis.

As a result, the plaintiff can establish that the costs associated with temporary storage of SNF were, in fact, caused by the breach. For instance, the *direct* costs associated with the construction, maintenance and operation of the ISFSIs are certainly recoverable. These amount to more than \$93.7 million. In addition to building the ISFSI structures, SCE had to manufacture special dry storage casks and undertake various design modifications in order to accommodate the casks. These damages were not contested beyond the blanket objection to the causation model, discussed below. However, the government contends that \$23.6 million in overhead on these projects should not be included among the damages. Furthermore, the government argues that the recovery of direct costs should be offset by certain expenditures pertaining to cask-loading operations at the ISFSI. We address each of these issues in more detail in the discussion that follows.

Independent of the ISFSI-related mitigation damages are the damages that SCE has incurred as a result of having to store the SNF off-site. This element of the plaintiff's damages is limited to SONGS Unit 1 SNF. The Unit 1 SNF is the oldest of SCE's spent fuel and would take priority under the OFF policy. Before decommissioning the reactor, SCE sent 270 assemblies from Unit 1 to the GE Morris facility where it continues to be stored to this day. Joint Stip. ¶¶ 20-23. But for the government's breach, SCE would have long ago arranged for the delivery of the GE Morris spent fuel. According to the plaintiff's damages model, all of the SONGS Unit 1 spent fuel would have been removed from GE Morris by the end of 2001. PX 104; Tr. 258. In the real world, however, the plaintiff pays a base fee of \$800 per month per assembly, plus an adjusted monthly charge. Joint Stip. ¶ 22-23; PX 8. From January 1998 to December 2005, the plaintiff has paid GE a total of \$29,395,063 in storage fees, \$26,827,548 of which are claimed by SCE as damages in this case. Tr. 319-20. These costs are well-documented and the amounts are not disputed by the government. See PX 137 (invoices and ledger of payments made to GE); Joint Stip. ¶ 24; Tr. 1230.

Acceptance of GTCC

As we indicated earlier, in establishing its causation model the plaintiff's proof, at least according to its pretrial submissions, did not factor in the effect of non-fuel radioactive wastes among the DOE's acceptance obligations. Under the terms of the Standard Contract, DOE was required to accept *both* spent fuel and HLW on an ongoing basis. In the *Yankee Atomic* case, the Court was for the first time presented with the question of whether the contractual acceptance obligations extended to GTCC. In other words, does the hardware leftover once a reactor is dismantled constitute HLW for purposes of the NWPA and the Standard Contract? See NWPA, 42 U.S.C. § 10101(12)(B) and Standard Contract, art. I (12)(B) (defining high-level radioactive waste as "other highly radioactive material that the [NRC], consistent with existing law, determines by rule requires permanent isolation.") The trial court ruled that it does. See *Yankee Atomic Elec. Co. v. United States*, 73 Fed. Cl. 249, 314-15 (2006) (*Yankee I*) (finding that "it is very unlikely that DOE would remove all SNF without also taking plaintiffs' GTCC waste.") Subsequently, in the same decision in which it reversed the trial court's causation analysis and established the proper acceptance rate, the Federal Circuit upheld the trial court's characterization of GTCC. Under current precedent, therefore, GTCC falls within the Standard Contract's definition of HLW, requiring permanent disposal in a geologic repository. *Yankee II*, 536 F.3d at 1277.

In light of the Circuit Court's contemporaneous holding that the acceptance obligations are spelled out in the 1987 ACR, the defendant argues that GTCC must be factored into the 1987 ACR and assume its place, along with the plaintiff's SNF allocations, in the OFF queue. See *Yankee II*, 536 F.3d at 1274 ("[T]his court interprets the Standard Contract as requiring the Department to accept SNF and HLW *in accordance with the 1987 annual capacity report process.*") The government argues that the plaintiff's failure to accommodate GTCC in its analysis is a failure of proof which is fatal to its causation case.

GTCC is not fuel. It is not generated on a predictable timetable as are the fuel assemblies routinely retired following their useful life in SCE's reactor. The utility will only accumulate GTCC if and when it dismantles and decommissions a nuclear reactor. Moreover, SNF can be accurately measured by the amount of uranium present in an assembly. By contrast, neither the government nor the nuclear utility industry has arrived at a convenient and uniform means of measuring the decommissioned parts that make up GTCC waste at these sites, at least not for purposes of determining the rate of acceptance under the Standard Contract. See Tr. at 767 (MTU is "not how one would measure radioactive waste streams."); Tr. at 1119-21 and 1143-45 (addressing potential methodologies for equating GTCC volumes to current SNF weight values in acceptance queue).

The government's primary fact witness was David Zabransky, the Chief Operating Officer for DOE's Civilian Radioactive Waste Management Program. He was also the contracting officer and was primarily responsible for implementing the Standard Contract. At trial, he confirmed that GTCC was not factored into DOE's acceptance schedules. Tr. 1129-31. In fact, the current repository licensing application – now subject to formal withdrawal - does not include GTCC. *Id.* at 1134; 1152-53. The NRC regulations do not include GTCC among the established categories of HLW, nor had DOE treated it as such. See *id.* at 1125-26 ("Prior to [2009], it wasn't considered high-level waste."); *but see Yankee II*, 536 F.3d at 1278 ("The definition of HLW in an NRC regulation, while a factor considered by this court and the trial court, does not control the parties' understanding of HLW as set forth in the Standard Contract.") In fact, certain environmental regulations and ongoing environmental compliance activities having no relation to the SNF disposal program, will no doubt have to be drastically revised if DOE is indeed directed to treat GTCC waste as HLW for all purposes. See *generally*, Tr. 719-32 and 773-76 (describing current disposal methods for GTCC). Of course, the holding of *Yankee Atomic* has no import beyond the legal interpretation and application of the Standard Contract. The Court of Appeals acknowledged this anomalous result. See *Yankee II*, 536 F.3d at 1278 ("[T]he technical regulatory definition of HLW does not overcome a rule that unambiguously requires permanent isolation of GTCC waste.") Mr. Zabransky informed the Court that DOE continues to treat GTCC materials as low level waste. Tr. 1152-53.

Thus over time, government policy has resisted treating GTCC as HLW. As Mr. Zabransky's testimony revealed, DOE has reached no conclusions as to how GTCC will be inserted into DOE's acceptance queue. *Id.* at 1130-32; 1141-42. But now, for litigation purposes alone, the government has seized upon the Court of Appeal's holding in an attempt to evade their own contractual obligations. Because HLW must be accepted *with* SNF, the government argues, SCE cannot paint an accurate picture of the non-breach versus breach world unless it accounts for HLW among its SNF allocations. See *id.* at 1086-87; 1102.

Treatment of HLW After *Yankee Atomic*

Certainly, DOE and the nuclear plants contemplated acceptance of HLW when entering into the contract. See Standard Contract, art. VI (B)(1)(a) ("DOE will first accept from Purchaser the oldest SNF and/or HLW for disposal ..") Based on the record *in this case*, however, they never contemplated that GTCC would fall under the definition of HLW. Compare *Yankee I*, 73 Fed. Cl. at 313-15 (The trial court outlined several indications that DOE would dispose of GTCC with SNF and other HLW). The testimony presented in this case confirms that DOE's ACR and APL systems do not account for storage or transportation of GTCC. Tr. at 284 and 336 (Myers).

In the wake of *Yankee II*, the utility's HLW, including GTCC, must be treated under the same OFF rule as SNF. The utilities certainly expected their GTCC to be hauled away for permanent disposal at some point. But it had not entered the calculus when they made the submissions required to determine their place in the queue for SNF acceptance.

The issues concerning the regulatory nature of GTCC are questions for another day and another forum. For our purposes, the Federal Circuit has redefined DOE's acceptance queue. As Mr. Zabransky reluctantly stated "[I]f you look at the [Standard Contract clause], it says that it shall be based upon the age of the SNF and/or high-level waste, so if GTCC is high-level waste, it would – its priority would be based upon its age just like the spent fuel." Tr. 1087. Mr. Zabransky attempted to describe the upshot of GTCC being inserted into the ACR system:

Well, that would depend upon the metrics that we used to measure it at that point in time because it's not clear that MTU would have been the best way of doing it, but to the extent it took operational capacity from the repository facilities, it would have had the same impact as the materials that were added here, and that's some degree of moving people back in the queue beyond where it was inserted.

Id. at 1102. Not only would certain stores of SCE's SNF be kicked back in line due to its own GTCC, the previously unaccounted for HLW-GTCC of other utilities ahead of SCE in the queue would necessarily result in SCE's acceptance allocations being delayed even further.

SCE's Revised Model

Throughout the plaintiff's case-in-chief, the defendant's cross-examination served as a constant reminder that the plaintiff's spreadsheet, PX 104, failed to give any consideration to GTCC. See, e.g., Tr. 336-37 (Myers). As the witnesses candidly admitted, SCE had not considered GTCC because it had not been included in the APR (PX 82) or in the ACR (JX 4) that DOE had produced. Tr. at 284; 336. Given the inherent uncertainties in entirely revamping this federal program – the rules and operating assumptions of which are dictated by DOE, not by the utilities – we are not sure how the defendant expected the plaintiff to factor GTCC into DOE's SNF acceptance schedule. Should the utility have come up with its own alternative unit of measurement for GTCC – a MTU equivalent – and applied it to the 1987 ACR? Should SCE have taken the liberty of establishing its own system of ranking the age of GTCC when even Mr. Zabransky admits that the OCRWM has not chosen from among the many alternative methodologies that might apply? See Tr. 1124-27. In the absence of any government census, should the plaintiff have made inquiries of all signatories to the Standard Contract in order to accumulate industry-wide data on the amounts of GTCC at each utility and the projected dates for disposal of GTCC wastes? Do we really expect that SCE could recreate the entire acceptance queue for the more than 100 nuclear

utilities in the nation, accounting for GTCC inventories at each, when DOE did not perform this task?

In the brief span of time between the Federal Circuit's affirmance with respect to the trial court's treatment of GTCC in the *Yankee Atomic* case and the trial in this case, the plaintiff did more than we could have expected in order to quantify the effect that the inclusion of GTCC might have on SNF acceptance rates. First, it surveyed its own GTCC and determined that the GTCC waste from SONGS 1 is one canister's worth. Tr. 283. There would be no GTCC waste attributed to SONGS 2 and 3 until those reactors cease operations, long after the damages period under consideration today. Second, SCE demonstrated at trial – we agree with the defendant that the plaintiff should have provided its analysis earlier than on the eve of trial – that the one canister of GTCC would not appreciably change the results of PX 104, SCE's causation analysis exhibit. We conclude that GTCC waste at SONGS Unit 1 represents a minimal amount of SCE's entire inventory of SNF/ HLW awaiting disposal. As Mr. Myers' testimony demonstrates, replacing one canister of SNF would reduce the utilities margin in that year by 24 assemblies. Under that hypothetical scenario, plaintiff's allocations under the 1987 ACR could easily cover the addition of GTCC waste. Even with the loss of 24 assemblies worth of space, SCE would not come close to jeopardizing its full core reserve. Tr. 291-92.

The timing of GTCC acceptance is harder to establish than the amount. First, as we have already explained, the defendant had not anticipated accepting GTCC under the Standard Contract. Second, the generation of GTCC does not lend itself to a straightforward OFF formula. The GTCC is not condensed into uniform assemblies which are discharged on a date certain, as is the SNF. Nor is GTCC waste immediately available for storage and/or disposal. As Mr. Reilly explained “[y]ou’ve got to cut up the internals of the reactor vessel before it’s available.” Tr. at 157.

The plaintiff shut down SONGS Unit 1 in 1993. However, the decommissioning process did not commence until June 1999. The plaintiff's witnesses assumed that GTCC could be disposed of in bulk once the unit had been fully decommissioned. Assuming that formal decommissioning is the appropriate benchmark, the GTCC from Unit 1 would not be inserted into the queue until the remaining SNF assemblies had been removed from the Unit 1 spent fuel pool in September 2004. Joint Stip. ¶¶ 29-30; 35. Mr. Reilly testified, with respect to the company's expectation of when DOE would have taken the GTCC:

Well, I think it occurs, essentially, during decommissioning, so it occurs after fuel, after the unit is shut down and somewhere near – well, after the last fuel is left, so I view it as the last fuel DOE takes, at which point, the contract for that plant is done.

Tr. 147. Given the DOE's past view that GTCC was not covered by the OFF policy, the defendant could offer no evidence to undermine Mr. Reilly's testimony. Mr. Zabransky

merely pontificated that assigning a date for GTCC acceptance depended on a number of variables, none of which had been covered by established policy. See Tr. at 1125 (“[D]epending on what it is ... it could be the date that the piece of material was taken out of service, it could be the end of the cycle that material was taken out of service, it could be when it was packaged and ready for transport, so there’s numerous dates that could be assigned.”)

Finally, in evaluating the impact of industry-wide GTCC levels on the 1987 ACR, plaintiff faced significant challenges. With no guidance from the contracting officer or the responsible agency, OCRWM, the plaintiff turned to another source within DOE for its best estimate on the total amount of GTCC within the nuclear utility industry – an environmental study commissioned by the DOE and published in the Federal Register two years prior to this trial. See Notice of Intent To Prepare an Environmental Impact Statement for the Disposal of Greater-Than-Class-C Low-Level Radioactive Waste, 72 Fed. Reg. 40,135 (Jul. 23, 2007); JX 8.

We admitted the report as evidence despite the defendant’s objections. The government objected to the sponsoring witness, and his testimony concerning the data in the document, not the document itself. Tr. 286-95. Later in its rebuttal case, the government called Ms. Christine Gelles to describe the context of the government study. Ms. Gelles, like Mr. Zabransky, is an employee of DOE. Although Ms. Gelles regularly interacts with the OCRWM, she shares no responsibilities in administering the Standard Contract. Tr. 690-93. She works within DOE’s Office of Environmental Management, where she holds the title Director, Office of Disposal Operations. Tr. 682. Her responsibilities fall within the area of regulatory compliance with environmental directives and her brief exposure to this program involved her department’s preparation of a GTCC Environmental Impact Statement (“EIS”) in accordance with the National Environmental Policy Act. Tr. 684, 693-99; 42 U.S.C. § 4321.

In preparing the EIS, Ms. Gelles is particularly interested in GTCC concentrations among DOE programs. She oversees DOE’s low-level waste disposal facilities. Notwithstanding the decision of the Court of Appeals in *Yankee II*, commercially generated GTCC falls within the scope of the department’s low-level waste program. Tr. 686-87; see also, Tr. 694-96 (explaining the regulatory distinction among four categories of low-level wastes: Class A, Class B, Class C and Greater Than Class C (GTCC)). Consistent with the testimony of Mr. Zabransky, Ms. Gelles confirmed that DOE does not track or record GTCC inventory in the commercial sector. Tr. 734. The most accurate information of this type would be in the hands of the particular utility generating the waste. *Id.*

In order to arrive at an estimate for the amount of GTCC within the industry, DOE contracted for a study by Sandia National Labs. The product of this study is contained in the July 2007 report entitled “Greater-Than-Class C Low-Level Radioactive Waste and

DOE Greater-Than-Class C-Like Waste Inventory Estimates.” PX 94; Tr. 705. Ms. Gelles reviewed and approved the report and subsequently released it to the public. Tr. 705-06.

The report estimates that a total of 58 cubic meters of activated metals GTCC waste exists within the nuclear utility industry. 72 Fed. Reg. at 41819. This figure was intended to capture collective GTCC waste estimates for utilities that had been decommissioned as of 2007. Tr. 738. The report further quantified the likely number of canisters that total volume represents, based on information as to canister capacity and GTCC inventory at a particular plant owned by Connecticut Yankee. Tr. 295-96; 742-43. Assuming that Connecticut Yankee’s canisters were representative of the commercial nuclear industry, the report concluded a per canister volume of GTCC of 0.24 cubic meters. Tr. 743-44. Pursuant to this methodology the quotient of total volume and per canister volume provides a rough estimate that, as of July 2007, approximately 241.7 assemblies of GTCC waste would have been inserted into the 1987 ACR acceptance queue in the hypothetical non-breach world. Tr. 296 (Myers); see also, Tr. 758-59 (Gelles).

There is no telling where among the 100 or so reactors, SCE’s GTCC waste falls. However, based upon the data furnished by the government-commissioned study, and the figures represented in DOE’s acceptance queue, it is a simple matter to estimate the total volume of GTCC as compared to overall SNF awaiting acceptance under the 1987 ACR. Mr. Myers, testified that the purported industry-wide GTCC – 58 cubic meters, or the equivalent of 241.7 assemblies of GTCC – amounts to less than one percent of industry-wide SNF for the first ten years of performance under the Standard Contract. During the course of the first 10 years of contract performance, over 18,600 MTU’s of SNF would have been accepted under the 1987 ACR. Tr. 296-97; see Table 2.1, 1987 ACR (JX 4 at SCE001900). Using the data from DOE’s most up-to-date APR, which projects total MTU and assemblies by originator and ranking date, Mr. Myers simply extrapolated how many assemblies would have been accepted during that same time frame – he arrived at a total of 26,694 pressured water reactor assemblies. Tr. 297-98; see DOE Acceptance Priority Ranking (July 2004) (PX 82) at App. 17. Therefore, almost 242 assemblies worth of GTCC existed in the industry, as compared to the approximately 27,000 SNF assemblies to be accepted by DOE through 2007. Tr. 298. The ratio does not even account for the boiling water reactor assemblies on the APR, which would drive the percentage even lower. Tr. 298-99. By any measure, this amount is statistically insignificant and would not have an appreciable affect on the SNF queue.

In arriving at this conclusion, we note that the government does not quarrel with the plaintiff’s math. Rather it emphasizes the weaknesses in its own report. During the examination of Ms. Gelles, the defendant highlighted the many limitations inherent in using an environmental planning document to estimate contractual obligations. However, the carefully contrived methodology was a good faith attempt to arrive at the best estimate of GTCC waste within the industry. In light of the fact that the OCRWM has not collected information from utilities about GTCC, see Tr. 1122, the 2007 report is

the best evidence available. See 72 Fed. Reg. at 40139 (“DOE has identified the estimated GTCC [Low level Waste] and GTCC-like waste volumes based on the best available data.”).

We have been confronted with many questions and few answers in connection with the GTCC issue. If and when DOE performs, GTCC wastes will presumably be accepted no earlier than the date the reactor was decommissioned. *But see*, Tr. at 1126 (Mr. Zabransky conceded that the OCRWM has made no final determination “for ranking the age of GTCCs”). At the present time, there is no consensus on how GTCC will be stored awaiting shipment, during transportation, or at its final resting place, whether that be in Yucca Mountain or elsewhere. Furthermore, DOE has given no indication that it will incorporate GTCC wastes into the 1987 ACR or any other planning document. Tr. 1130-32 (Zabransky). Indeed, Mr. Zabransky appeared completely disinterested in the GTCC data compiled by his DOE colleague, Ms. Gelles. As Mr. Zabransky admitted in his own testimony, he had only a passing familiarity with GTCC disposal “because other parts of DOE have had the responsibility for its disposal.” Tr. 1053; Tr. 1116-18. He is the first to admit there has been no effort on the part of his office to arrive at a method of measuring GTCC for purposes of determining a corresponding acceptance rate for the MTU. Tr. 1119-20.

We do know two things about GTCC, however. First, we know that SCE itself had only one canister of GTCC, the rough equivalent of 24 assemblies of SNF at its plant. Secondly, we know from DOE’s own attempts to extrapolate industry-wide GTCC data, that the entire universe of GTCC at issue here is approximately equivalent to 241 SNF assemblies. In applying the first of these figures to SCE’s 1987 ACR Causation Analysis (PX 104) – which, of course did not include the GTCC volumes – it is readily obvious that even factoring in an additional 24 assemblies in any of the years reflected on that chart would not have significantly affected the utility’s margin over full core reserve. In every year the margin remains a positive number, even with the inclusion of GTCC. Consequently, the plaintiff has demonstrated that it would not have been required to build an ISFSI absent the government’s breach.

Likewise, were we to hold the plaintiff to the impossible burden of accounting for the collective GTCC waste in the entire industry, the government’s own GTCC estimate suggests a minimal impact on plaintiff’s causation model. GTCC volumes account for less than one percent of the SNF to be accepted in the first 10 years of performance. Although the DOE-commissioned study provides no more than a potential snapshot of total GTCC, these wastes are only generated when a reactor is permanently shutdown. Unless there was a rash of decommissioned reactors during the damages period, the amount of GTCC would remain relatively stable. In sum, using the best of a meager amount of facts regarding GTCC, SCE has convinced us that GTCC represents a minor element in the SNF queue and does not impair the plaintiff’s compelling case for causation.

Moreover, in the context of expectancy damages, any risk of uncertainty is assumed by the party whose wrongful conduct caused the damages. See *Energy Capital*, 302 F.3d at 1327 (citing *Mid-Atlantic Tablewares, Inc. v. Mogi Trading Co.*, 100 F.3d 1353, 1366 (7th Cir. 1996)); *Locke v. United States*, 283 F.2d 521, 524, 151 Ct. Cl. 262, 267 (1960) (“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.”) (citation omitted). We believe the same rule applies to plaintiff’s mitigation damages. In considering this issue, we are mindful that “where responsibility for damage is clear, it is not essential that the amount thereof be ascertainable with absolute exactness or mathematical precision: It is enough if the evidence adduced is sufficient to enable a court or jury to make a fair and reasonable approximation.” *Nat’l Austl. Bank v. United States*, 452 F.3d 1321, 1327 (Fed. Cir. 2006) (citing *Bluebonnet Sav. Bank v. United States*, 266 F.3d 1348, 1355 (Fed. Cir. 2001)); See also *Locke*, 283 F.2d at 524 (“Difficulty of ascertainment is not to be confused with right of 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.”) (citing *Eastman Kodak Co. v. Southern Photo Materials Co.*, 273 U.S. 359, 379 (1927)).

Overhead Costs

A. General

In addition to the direct costs SNF plaintiffs incurred as a result of the defendant’s breach, most utilities have also claimed one or more variants of indirect costs, including several categories of overhead expenses. In this case, SCE’s overhead costs account for a significant percentage of its overall damages; the plaintiff claims over \$23 million in overhead associated with operations at the SONGS ISFSIs. See PX 125 (breakdown of \$146,349,316 total damages claim); DDX 4 at 21-22.

The plaintiff allocated continually incurred routine costs to overhead accounts associated with the company’s mitigation activities. Most of these costs are of the type that had been incurred prior to the breach and would be incurred as a result of normal operations at SONGS, irrespective of the breach. They comprise, for example: lease payments, costs of security, fire protection and medical services, Federal Emergency Management Agency fees, and environmental regulatory requirements such as offshore monitoring and compliance with its fish impingement license. Tr. 1215. Each and every cost incurred in relation to the SCE’s operations was given a specific code and was subject to audit. The evidence demonstrated the manner in which SCE captured these costs and allocated a portion of those costs to individual projects, including the ISFSI.

The defendant argues that a large percentage of the captured expenses are not incremental to the breach and, therefore, should not be included as damages for the government’s partial breach. The government’s expert witness, Mr. R. Larry Johnson – whose expertise lies in forensic accounting and financial analysis, not the law – explained the incremental costs concept as it pertains to the overhead claims in this

case. Tr. 1156; Tr. 1167-68. He postulated that recovery should be limited to that which “was necessary and related to spent fuel activities and would not have been incurred but for the breach.” Tr. 1177; see *also* DDX 4 at 5. The plaintiff contends that each of the costs included among its overhead claim represents true costs to the company, a portion of which are properly allocated to the ISFSI just as they would be to any other component of SCE’s business.

The government does not dispute that the amounts claimed represent actual costs, or that these costs were properly recorded on SCE’s general ledger system. Joint Stip. ¶¶ 42-45; Tr. 1248-49 (Johnson). On direct examination, SCE witnesses described their accounting procedures and confirmed that the company complied with generally accepted accounting principles (GAAP), and that the management of overhead pools complied with Federal Energy Regulatory Commission guidelines. Tr. at 819 (Berkin). Neither the government’s cross-examination of these witnesses, nor the expert testimony of its own witnesses, exposed any significant concerns with the reliability or accuracy of the accounting methods used. Thus we accept the quantum of the various costs incurred by SCE. Based on the uncontroverted record, we find that SCE has properly recorded its expenses and allocated a portion of those expenses to the company’s ISFSI project. What is left to determine is whether these properly allocated overhead costs constitute a measure of plaintiff’s damages. See Def. Br. at 66.

B. Categories of Overhead

(i.) Common Allocation

“Common allocation” includes expenses that support the entire SONGS site, and which are required by the SONGS operating license and regulatory authority. As Mr. Reilly testified, these costs include items such as the plant’s security, the emergency response system, lease payments, regulatory fees, and the costs of complying with various environmental measures and disposal requirements. See *generally* Tr. at 171-81. The costs are allocated among different projects at SONGS on a constantly adjusting basis.

By definition, the overheads are not tied directly to on-site storage of SNF. Tr. 171-72; 181. Such expenses would be considered “direct costs” of mitigation and are categorized independently in plaintiff’s claim. Jorge Morales, the project manager for the construction of the ISFSI, and David Cowell, SCE’s budget analyst, testified at length concerning common allocation overheads. The defendant pursued a common theme at cross examination: The witnesses performed no analysis, nor were they aware if one had been done, to determine the extent to which common allocation costs at SONGS varied as a result of the ISFSI project. See Tr. 499-500 (Morales); Tr. 640-41 (Cowell).

Plaintiff's common allocation costs for the SONGS Unit 1 ISFSI were \$13,236,815. Joint Stip. ¶ 43. The common allocation costs for SONGS Units 2 and 3, were significantly less, \$2,521,206, because dry storage operations were limited prior to December 31, 2005, the endpoint. *Id.* at ¶¶ 41, 45. Unit 1's share of security costs and insurance overheads are \$2,181,109, and \$180,195, respectively. *Id.* at ¶ 43. The latter category represents property liability and workers' compensation insurance which, as the defendant has noted, were not necessarily "driven by the storage of spent fuel." Def. Br. at 16 n.8; see *also*, Tr. 1213-14 and DDX 4 at 28.

(ii.) *Corporate Administrative and General*

The plaintiff maintained two separate accounts reflecting corporate administrative and general (A&G) overhead costs. Project manager Dena Berkin indicated that an account labeled the "920 account" represents primarily salaries, bonuses and other employee compensation. Tr. 802. Another account, the "921 account," includes expenses charged by the employees. *Id.* at 804-05. Ms. Berkin conceded during cross-examination that the corporate A&G pools were not necessarily limited to individuals whose employment is dependent upon the ISFSI. *Id.* at 802-04. Other costs included in corporate A&G are those associated with managing SCE's corporate physical properties, administering certain facility contracts and distributing power to SCE's customers. Tr. 807-10.

Certain of these commitments pre-dated SCE's mitigation activities. *Id.* Neither Ms. Berkin nor Mr. Morales, who also provided testimony concerning corporate A&G overhead, was aware of any data tracking whether corporate A&G costs increased or decreased with the construction and continued use of the ISFSI at SONGS. *Id.* at 805-07; 811-12; Tr. 500.

Plaintiff claims capitalized administrative and general overhead of \$3,172,181 for SONGS Unit 1 and \$1,359,200 for SONGS Units 2 and 3. Joint Stip. ¶¶ 43-45.

(iii.) *Internal Market Mechanism*

The third general category of indirect costs sought by SCE is Internal Marketing Mechanism ("IMM") overhead, which includes labor, material and services for activities other than nuclear fuel management. As the government elicited on cross-examination of Ms. Berkin, these overhead costs are associated with the internal management of such entities as the corporate real estate division and the mechanical shop. Tr. 813-14. Still, the IMM divisions have a portion of their overhead allocated to the ISFSI. Tr. 813-16.

The record shows IMM overhead costs of \$773,912 for SONGS Unit 1 and \$233,173 for SONGS Units 2 and 3. Joint Stip. ¶¶ 43-45. Once again, the government argues that these costs are not attributed to the breach and are not directly related to SCE's mitigation activities.

C. Findings and Conclusions Regarding Overhead

Mr. Johnson testified that SCE's overhead damages for SONGS 1, \$19,544,212, and SONGS Units 2/3, \$4,113,579, should be reduced by \$18.7 million and \$3.8 million, respectively. Tr. 1214; 1216. The government's theory, as represented by his expert opinion, rests on the overarching assumption that overhead may not be charged to the breach, or to SCE's mitigation response, unless the costs can be traced directly to the utility's dry storage needs. His testimony reflects the government's opposition to each and every overhead expense. We quote at length:

Q: Let's look at the next subcategory of costs under the Unit One overhead, which is security. Generally, what types of costs are included under the security subcategory, as you understand it?

A: It's site security; so it's the access security, it's the guards, it's the oversight of the whole security of the site.

And the testimonial record is that the staffing won't have changed. The security guard is someone that waves people in after making sure they're authorized, and that has nothing to do with something being distinctly related and unique to whether there was [contract] performance. So these costs are costs, much as the other categories I've described, where SCE would have the same costs; they would have the same need to secure the site; they would have the same need for guards and control over access.

The existence of the ISFSI is not – is not unique. There are other things on the site that are being secured and protected. Unless the ISFSI was the only thing on the site, these costs ought not to be included.

Tr. 121-13.

The government argues that the plaintiff has failed to carry its burden of proof because its witnesses "did not consider what actual costs, if any, would have been incurred by SCE absent DOE's delay." Def. Br. at 16. Defendant has been persistent in its attempts to turn our focus to the delta – or lack thereof – between overhead expenses prior to the breach and overhead expenses after the breach. Def. Br. at 66, 69. It argues that recovery of overhead would result in an impermissible windfall and have the government "effectively subsidizing the corporate operations of nuclear utilities." Def. Br. at 69. Framed in other words, the government's argument is that only direct costs may be recovered for a partial breach. The defendant thus rejects the fundamental nature of overhead damages.

The SONGS overhead fluctuates over time. As the witnesses explained, costs may go up or down based upon the work being performed at each site at any given time. See Tr. at 644-45 (Cowell); Tr. at 828-31 (Murray on variable security costs); Tr. at 821

(Berkin on corporate A&G pool changes). Overhead includes fixed costs representing requirements of running the company. Many of these “fixed costs” are typical expenditures of the utility’s normal operations. However, the fact remains that the construction, operation and maintenance of a dry storage facility at SONGS is nothing if it is not a necessary and integral part of SCE’s overall operations. Consequently, it draws on the company’s resources, whether they be payroll services, insurance, or a host of other general expenses which represent the costs of doing business. We agree with the plaintiff’s view that the claimed overhead expenses are “necessary to complete the breach-caused projects.” Pl. Br. at 49; Tr. at 476-82 (Morales); Tr. at 208-11 (Reilly); Tr. at 613-14 (Cowell).

With a few limited exceptions, trial court decisions in previous SNF cases which have addressed the overhead issue have found recovery is proper where there is some connection between the mitigation project and the utilities’ overhead. See, e.g., *Tenn. Valley Auth.*, 69 Fed. Cl. at 535, 542 (finding payroll services overhead properly allocated on percentage basis to mitigation activities; no evidence supporting management allocations); *Sys. Fuels, Inc. v. United States*, 78 Fed. Cl. 769, 799 (2007) (denying payroll and capital suspense “loader” costs and allowing material “loader”), *on reconsideration*, 92 Fed. Cl. 101 (2010); *Sacramento Mun. Util. Dist. v. United States*, 70 Fed. Cl. 332, 376-77 (2006) (*SMUD I*) (Damages offset due to plaintiff’s failure to demonstrate that costs of human resources, office equipment and the like, were incremental to breach), *rev’d in part on other grounds*, 293 Fed. Appx. 776 (Fed. Cir. Aug. 7, 2008); *Dominion Resources*, 84 Fed. Cl. at 280-81 (Allowing material overhead, and management and executive services overhead, including costs of “salaries of the corporate accounting group, executives, and corporate security” distributed across projects during the time in question).

The mitigation project must take its place among all the other projects supported by SCE’s overhead. See *Carolina Power I*, 82 Fed. Cl. at 48 (“Overhead, by definition, is a cost of doing business, and for some period of time, part of [the utility’s] ‘business’ was mitigating DOE’s partial breach.”). The record demonstrates common overhead was allocated on a percentage basis to the ISFSI and related activities. See Crowel testimony, Tr. at 613 (ISFSI project “receives a *pro rata* distribution of [corporate] costs every month based on a total cost basis.”); see also, Tr. 211-12 (Reilly); Tr. 822-23 (Berkin). In the *Carolina Power* case, the Court of Appeals affirmed the trial court’s award of stores overhead – warehousing and related labor costs – as well as indirect overhead expenses consisting of salaries for managers and financial employees. *Carolina Power II*, 573 F.3d at 1276-77. The Court found these costs were properly diverted to the utility’s mitigation projects. As in our case, the plaintiff employed an internal accounting system, using codes to allocate a portion of the overhead to particular projects, based on the work being done to support a project at a particular point in time. *Id.*

Although the activities charged to overhead in these cases may differ from our own, the guiding principle is the same. If a proportional amount of the utility's general overhead is not allocated to the ISFSI, other projects and SCE operations will support an unequal share of the overhead costs. See *id.* at 1277 (“[I]f [the plaintiff] had not applied stores overhead to breach-related work projects ... other activities would have assumed a disproportionate amount of the total overhead costs.”) It is plain to see, therefore, that fixed overhead is, in fact, causally linked to the breach. Had the government not created the need for temporary dry storage at the plant, SCE “could have allocated [its] resources to other projects.” *Dominion Resources*, 84 Fed. Cl. at 281.

There is no practical alternative method of capturing overhead. It would be unreasonable to require the plaintiff to fragment its corporate functions and establish separate operations to support the mitigation project, to create a sort of mitigation subsidiary. In our view, such a course of action is not only impractical but would likely result in a far greater cost to the company, and ultimately translate into far greater damages against the government. We credit SCE's officers' testimony that the company's allocation scheme reduced the costs of mitigation. Tr. at 476 (Morales). To reject plaintiff's fiscally sound and commonly accepted means of accounting for and allocating overhead expenses, therefore, would lead to impermissible results. *Cf., Tenn. Valley Auth.*, 69 Fed. Cl. at 536 (permitting government offset for plaintiff's use of its own heavy equipment “would have the perverse effect of penalizing TVA for taking cost-effective steps to mitigate damages.”)

Private Fuel Storage

Plaintiff claims just over \$2 million in damages for its investment in Private Fuel Storage, LLC (PFS). The PFS project was a mitigation strategy pursued by SCE and a number of other similarly situated utilities. The plaintiff is one of eight utilities in the PFS consortium, which had a leading role in developing and managing an initiative to provide away-from-reactor storage for SNF. Joint Stip, ¶¶ 46-47. The consortium, in turn, partnered with various Native American tribes with the intention of building and operating temporary storage facilities on tribal lands. *Id.*

Plaintiff began investing in PFS several years before DOE's breach and became an equity partner in the venture. Other utilities opted to participate to a lesser extent in PFS, paying membership dues which would have entitled them to storage space but not pursuing a partnership share. Presumably, these companies looked to gain a storage option for their SNF, while consortium members might actually profit in a business sense if and when PFS became operational. As an equity partner, SCE secured first priority for its SNF. Moreover, as a result of its investment, SCE was positioned to sell storage space to the other nuclear power generators. See Tr. at 410 (acknowledging potential return on investment.)

The parties have stipulated that between the years 1994 and 1999, SCE properly recorded \$2,088,656 in charges related to PFS. Joint Stip. ¶¶ 47. As it turned out, however, PFS never advanced beyond a conceptual mitigation strategy. Plaintiff's initial investment of 12.5 percent dwindled as the company declined to maintain capital contributions. After 1999, SCE ceased funding PFS altogether. Although the partnership is intact, and SCE's shares in PFS could theoretically be sold, SCE executives at trial testified that the project is defunct and the entire investment in PFS is worthless. See Tr. 182-85 (Reilly).

Recovery of PFS expenditures has been an issue in several other SNF cases. The government's objection goes to the foreseeability of these mitigative steps. Thus recovery varies with the facts of each case. See *Bluebonnet Sav.*, 266 F.3d at 1355 ("Foreseeability is a question of fact ..."); *Dairyland Power Co-op v. United States*, 82 Fed. Cl. 379, 386 (2008) (citing *Home Sav. of America v. United States*, 399 F.3d 1341, 1353 (Fed. Cir. 2005)). The plaintiff must demonstrate that the magnitude and type of damages were foreseeable at the time that the parties entered into the contract. *Wells Fargo Bank v. United States*, 88 F.3d 1012, 1023-24 (Fed. Cir. 1996). These PFS claims have been denied because the utilities' expenditures were found to be speculative investments and thus not foreseeable. See *Ind. Mich.*, 422 F.3d at 1376; *Southern Nuclear*, 77 Fed. Cl. at 446; *Pacific Gas & Elec. Co. v. United States*, 73 Fed. Cl. 333, 429-30 (2006) ("*PG&E I*"), *aff'd in part, rev'd in part and remanded*, 536 F.3d 1282 (Fed. Cir. 2008).

In this case, the evidence demonstrates that PFS was no more than a hopeful enterprise. Paul Myers, a former SCE manager who also served on the PFS board of directors, candidly admitted that he and his colleagues at SCE viewed the project as somewhat of a long shot. Tr. 403. The utility never resolved its concerns regarding the shipment of SNF from its plant on the coast of California to the proposed site of an eventual PFS facility – an Indian reservation in Utah. *Id.* at 407.

The speculative nature of the mitigation strategy was a significant factor in the denial of PFS damages in other spent fuel cases. For instance, in the *Indiana Michigan* case, the Court of Appeals reasoned:

[Plaintiff's] own witness characterized the planned [PFS] facility, in which it abandoned financial investment in 2002, as "too speculative" when proposed. While DOE should have foreseen that its breach would force Indiana Michigan to find alternative storage for its SNF, it is not liable for such a speculative venture and unforeseeable costs.

Ind. Mich., 422 F.3d at 1376; see also, *PG&E I*, 73 Fed. Cl. at 429-30 (detailing obstacles facing PFS, including licensing, siting difficulties, and public opposition); *Southern Nuclear*, 77 Fed. Cl. at 445 (following *Ind. Mich.* and *PG&E*).

Moreover, the evidence reveals PFS was a back-up plan or contingency storage option in the event SCE was unable to build an ISFSI at SONGS. Tr. 406; see *PG&E I*, 73 Fed. Cl. at 430; *Southern Nuclear*, 77 Fed. Cl. at 443 (describing PFS project as private off-site ISFSI, and characterizing it as an “insurance policy in case any of a host of possible obstacles to [on-site] storage rendered that option unusable.”). As the defendant argues in its post-trial brief, SCE presented no evidence that PFS was pursued in lieu of an ISFSI at the plant.

SCE cited a single trial decision supporting an award of damages for PFS, *Northern States Power Co. v. United States*, a case in which the stay in appeals was only recently lifted. 78 Fed. Cl. 449 (2007), *appeal docketed*, No. 08-5037 (Fed. Cir. Feb. 13, 2008). Two other decisions of this court have since followed suit. See *Wisconsin Elec. Power Co. v. United States*, 90 Fed. Cl. 714 (2009) and *Dairyland Power Cooperative v. United States*, 90 Fed. Cl. 615, 647-51 (2009).

In *Northern States Power*, the trial court reimbursed the utility for expenses associated with the PFS strategy because the general manager of Northern States viewed PFS as the utility’s only means of addressing DOE’s impending breach. See *Northern States*, 78 Fed. Cl. at 465-66 (citing trial testimony describing PFS as “one of our only credible alternatives” to allow sustained operations at the plant). The PFS initiative was the main alternative, in part because physical limitations and licensing issues at the plant precluded on-site storage. *Id.* at 466.

Similarly, in *Dairyland Power*, the court reasoned that the off-site storage mitigation strategy was foreseeable in light of evidence suggesting that certain plant limitations made an on-site ISFSI impractical. *Dairyland Power*, 90 Fed. Cl. at 651.

Finally, in *Wisconsin Electric* the court relied upon specific testimony and contemporaneous documentary evidence demonstrating that PFS, despite higher costs and the delay in achieving storage capability, may have been viewed as a preferred alternative to on-site dry storage. In securing the requisite approval for construction of its ISFSI, the utility had been criticized by regulatory authorities for not sufficiently exploring PFS. Its pursuit of PFS was motivated by well-founded concerns that the Wisconsin Public Service Commission would disapprove additional casks for the ISFSI. As a result, the utility would not be able to operate through the end of its license. *Wisconsin Elec.*, 90 Fed. Cl. at 779. The testimony revealed that Wisconsin Electric had confronted steep resistance due to concerns by the Commission that the utility’s dry storage project “would ultimately become what they called a *de facto* permanent storage.” *Id.* In that case, therefore, PFS and approval of the ISFSI were inextricably linked. The plaintiff pursued the parallel mitigation approaches – dry storage which would be available sooner, and PFS which would “be too late for [the plaintiff’s] immediate needs and would be more expensive than dry storage” – because the utility was not confident that the regulatory agency would approve the utility’s second round of

cask loading had the utility not been aggressively pursuing a plan to use an ISFSI off the reactor site. *Id.* at 782. Moreover, the court credited witness testimony that possible financial gain was not a motivation.

The motivations and corresponding causation here differ. This case is more like the *Indiana Michigan*, *PG&E* and *Southern Nuclear* cases. While it is true that the plaintiff engaged in parallel pursuits of both PFS and an on-site dry storage unit, the impetus for the two initiatives share little in common.

In contrast to the case discussed above, SCE's own witnesses questioned the viability of the venture. The pursuit of PFS, even if reasonable, was admittedly speculative. Furthermore, SCE was not content to be merely a PFS customer – an option that would have provided temporary storage in the event of breach. *Compare PG&E I*, 73 Fed. Cl. at 429 (Utility discontinued equity partnership in PFS partly because it determined that “it could gain the same benefits from PFS as a customer.”) What the trial testimony described instead was SCE's decision to assume a leading business role in the potential enterprise. Tr. 323-24, 403-04. (Myers); *see also*, Tr. 909-11 (Neuberger). In fact, as Mr. Myers admitted on cross-examination, the utility invested in a larger PFS share than would one day be required to store all of SCE's spent fuel. Tr. 408.

SCE stood to make large profits with the right regulatory treatment and a positive industry response. As the government economist, Dr. Jonathan Neuberger, explained at trial, plaintiff's investment provided two benefits, “both of which have had value at various points in time and some of which may still have value.” Tr. 867. The investment would not only guarantee SCE preferential treatment for its own storage needs, but also establish an ownership interest in the storage solution and allow the company to convert many of its competitors into customers. *Id.* at 86-89; Defendant's Exhibit (“DX”) 189 at 29. With greater opportunity for profit comes greater risk. Were we to award over \$2 million to SCE for the PFS program, we would effectively have insured the utility against any downside investment risk. Plaintiffs have provided no persuasive authority for allowing mitigation damages of this nature.

In summary, we apply the rule as it is described by SCE: “[T]he touchstone of the inquiry is the motivation for PFS expenditures.” PI. Reply at 13. We believe the plaintiff's decision to invest in PFS as an equity shareholder, rather than as a potential customer, reflects plaintiff's motivation. Plaintiff was not merely looking into a mitigation strategy for its own spent fuel – it was banking on the enterprise to succeed and for PFS to become the industry-wide solution for temporary spent fuel storage.

Apart from the speculative nature of PFS, we experienced considerable difficulty on this record in determining the amount of plaintiff's PFS damages. Plaintiff obtained an equity share in PFS that ranged from 12.5 percent of the project toward the beginning of SCE's involvement to 5 percent in 2001 when it ended its participation in the consortium. The PFS participation agreement permitted SCE to sell its shares. Tr. 415;

DX 98. And, in fact, other utilities did sell their shares of PFS, which pre-supposes that there was a market for them. Tr. 418-19; PX 43; see also, Tr. 876-77, 911 (Neuberger). Because the plaintiff did not attempt to sell its shares we have no way of determining if the over \$2 million of expenditures in PFS might have been offset at a point in time when the investment still had some value. See *Southern Nuclear*, 77 Fed Cl. at 446 (“[A]ny recovery would require a finding that the retained equity interest, represented by the PFS investment, is of no value, a finding the court declines to make on this record.”); Tr. 334:9-13 (Myers); Tr. 182:1-4 (Reilly). In summary, even were we to depart from the majority approach and permit recovery of PFS expenditures, we could not in good conscience award the entire \$2,088,656 sought by the plaintiff.

Allowance for Funds Used During Construction

In addition to its direct and overhead costs respecting the construction and operation of the ISFSI, the plaintiff claims certain expenses of financing the project. Among its claimed damages is \$605,594, representing the company’s Allowance for Funds Used During Construction (AFUDC). Joint Stip. ¶ 44. Recording AFUDC is a recognized method of accounting for the value of money associated with capital expenditures. Including AFUDC in the cost of capital projects is an industry-wide practice among public utilities. *Tenn. Valley Auth.*, 69 Fed. Cl. at 541. In this case, plaintiff recorded AFUDC only in relation to the SONGS 2 and 3 ISFSI; SONGS Unit 1 activities were funded from a decommissioning trust and thus required no financing. Tr. 609-10 (Cowell).

The defendant acknowledged that SCE is entitled by regulation to record AFUDC. However, the government opposes the inclusion of AFUDC as damages, arguing that AFUDC is “at bottom, an acknowledgment of the loss of the time value of money expended upon construction projects.” Def. Br. at 72. According to the government, SCE is indirectly seeking interest on its mitigation damages, in violation of the rule that the government may not be held liable for prejudgment interest absent an explicit waiver of sovereign immunity. See 28 U.S.C. § 2516(a) (“Interest on a claim against the United States shall be allowed in judgment of the United States Court of Federal Claims only under a contract or Act of Congress expressly providing for payment thereof.”); *England v. Contel Advanced Sys., Inc.*, 384 F.3d 1372, 1379 (Fed. Cir. 2004); see also *Library of Congress v. Shaw*, 478 U.S. 310, 321 (1986) (rejecting attempts to re-characterize “interest” in order to avoid the no-interest rule.) Plaintiff has identified no provision within the Standard Contract nor any statute that would serve as an exception to this principle. Instead, the plaintiff argues that the normal rule against interest on a claim does not apply. According to the plaintiff, AFUDC is not interest on a claim, but interest as a claim. See Pl. Br. at 58, n.28 (describing AFUDC as interest as “an element of damages.”).

This argument has been resolved against the plaintiff in the majority of SNF cases tried to date. See *Wisconsin Elec.*, 90 Fed. Cl. at 794; *Dominion Resources*, 84 Fed. Cl. at 284-85; *Consumers Energy Co. v. United States*, 84 Fed. Cl. 670, 675-77

(2008); *Carolina Power I*, 82 Fed. Cl. at 53; *Sys. Fuels*, 79 Fed. Cl. at 69-70; *Northern States*, 78 Fed. Cl. at 471-72; *Southern Nuclear*, 77 Fed. Cl. at 449. The plaintiff's "interest as a claim" theory cannot prevail where, as here, the utility issued generalized debt instruments in order to fund ISFSI activities. Tr. 628; 632 (Cowell); see *Sys. Fuels*, 79 Fed. Cl. at 70 (Recovery of financing costs denied absent showing that "directly related to required borrowing through specific debt instruments.").

The plaintiff recognizes that its claim for AFUDC is contrary to the greater weight of authority. SCE's treatment of these cases is relegated to a footnote in its brief:

We acknowledge that, with the exception of *Tenn. Valley Auth.*, 69 Fed. Cl. at 540-42, other spent fuel damages cases to date have denied recovery for AFUDC, mostly on the grounds that the company debt for utilities is typically not assigned or attributed to a specific project such as construction of a dry storage facility. *E.g.*, *Dominion Resources*, 84 Fed. Cl. at 285. We respectfully disagree with those decisions and their rationale. In the real world, it is unquestionably more efficient for most utilities to issue "general," as opposed to "specific," debt, and that is the standard industry practice. We do not believe the applicable legal principles should effectively penalize utilities for such efficient and well-recognized practices. An award of AFUDC is necessary to place the plaintiff in as good a position as if DOE had performed, and is allowed by the controlling authorities.

Pl. Br. 59 n.29.

The court is aware of at least one other case, published since the close of post-trial briefing, in which the utility recovered financing costs. In *Energy Northwest*, the trial judge recognized the decisions rejecting the damages associated with financing an ISFSI, but suggested that "[i]n none of these cases ... has the claim for recovery of the cost of financing been so directly traceable to the borrowing for the capital expenditure, in this case, dry storage for SNF mitigation of [DOE's] breach." *Energy Northwest v. United States*, 91 Fed. Cl. 531, 555 (2010); see also *Sys. Fuels, Inc. v. United States*, 92 Fed. Cl. 101, 110-14 (2010) (addressing the "no interest rule" in the context of AFUDC and suggesting *en banc* review).

On the facts of our case, however, SCE has not convincingly demonstrated that its AFUDC costs can stand as an independent interest claim. As the plaintiff has already explained, there are no specific loans which can be directly traced to the ISFSI project. We believe that this requirement applies to AFUDC just as it applies to other costs of financing. See *Wisconsin Elec.*, 90 Fed. Cl. at 799 (Court acknowledged that AFUDC was a separate line item approval on the utility's ISFSI permit, but found "[t]here is no tracing to a borrowing, no showing of increase in borrowing because of the dry storage project, and conversely no showing of a decrease in borrowing thereafter."); *but see*

Tenn. Valley Auth., 69 Fed. Cl. at 542 (rejecting defendant’s argument that AFUDC requires a “match between capital expenditures and specific debt instruments.”) We, therefore, find that the plaintiff’s AFUDC damages are barred under 28 U.S.C. § 2516.

GTCC Storage Costs

There is one final element of SCE’s damages that gives us pause. SCE has claimed \$1,260,771 associated with storage of GTCC. See Joint Stip. ¶ 39 (“If DOE did not accept any SONGS Unit 1 GTCC from SCE prior to 2005, SCE would have incurred \$1,260,771 to store the SONGS Unit 1 GTCC onsite.”)

SCE’s engineering chief, Mr. Reilly, estimated that it would have cost between \$1 and \$2 million to store on-site the GTCC resulting from the decommissioning of SONGS Unit 1. The government concedes that this estimate is reasonable, but argues that these amounts should not be included among the plaintiff’s damages. According to the government SCE has not demonstrated that the GTCC waste stored in the SONGS Unit 1 pool would have been picked up by December 2005, the ending period for damages in this particular case. DDX 2 at 19; see Defendant’s Post-Trial Memorandum of Contentions of Fact and Law at 52 (“We are not currently aware of any utility, including SCE, that has segmented its reactor core early enough in time for its GTCC waste to be inserted into the acceptance queue prior to 2007.”). Consequently, SCE is not entitled to \$1,260,771 in GTCC storage costs claimed during the plaintiff’s damages period. This is an odd argument – a remarkable about-face – considering the government’s insistence throughout the trial that the plaintiff’s causation model was fatally flawed because GTCC – both SCE’s GTCC and that of other utilities – would have affected SCE’s SNF acceptance queue.

We have thoroughly analyzed GTCC’s impact, if any, on SCE’s acceptance queue. In so doing we also addressed the problems inherent in applying GTCC quantities to the OFF scheme in place at the time. There is no clearly defined policy on determining the age of GTCC, as there is for SNF. Tr. 1124-27. There is no convenient and recognized form of measurement for purposes of including GTCC and SNF together for purposes of allocating each in the same queue. *Id.* 1120-21; 1131-32. We are not even sure if the containment system for GTCC and SNF would share common characteristics. And we suspect that DOE and the nuclear utility industry have no better understanding of these issues than ours. See *id.* at 1064 (In describing “preliminary” plans for SNF and HLW casks, Mr. Zabransky admitted “that’s kind of a confusing area right now”). In sum, it is no small challenge to divine the hypothetical non-breach world under these circumstances.

We accept the premise that each party operated under the assumption that GTCC would not be picked up until the decommissioning process was complete. See Reilly testimony, Tr. at 147 (“Well, I think it occurs, essentially during decommissioning, so it occurs after fuel, after the unit is shut down and somewhere near – well, after the last fuel is left, so I view it as the last fuel DOE takes, at which point, the contract for that

plant is done.”) Although SONGS Unit 1 ceased operations in November 1992, decommissioning did not commence until June 1999. Joint Stip. ¶ 25. Yet the plant could not be fully decommissioned for several years after that date, when all of the SONGS Unit 1 assemblies had been removed from SAFSTOR storage in the Unit 1 pool. *Id.* at ¶¶ 29-30. It was not until 2001 that SCE’s GTCC was removed from the reactor. It was subsequently packaged into a modified storage canister and then placed in the ISFSI in 2004. *Id.* at ¶¶ 37-38. By that time, there were stores of SNF ahead of the GTCC in the OFF queue.

The defendant is correct in questioning the timing of its acceptance obligations with respect to this material. Even SCE’s designated representative, Mr. Reilly, acknowledged the possibility that DOE’s GTCC acceptance obligations did not arise until 2006 (which would make this an issue for a subsequent claim). Tr. 160. At any rate, the evidence of GTCC acceptance is anything but definitive, as Mr. Reilly’s testimony demonstrated. When asked on direct-examination if SCE would have avoided GTCC storage costs in the absence of the breach, he waffled: “You know, it’s hard for me to say, knowing exactly when they would have taken it, but probably.” *Id.* at 148. Subsequently, on cross-examination, he left even more doubt as to when the GTCC would have left SONGS:

I think we’re trying to be too precise. There isn’t a schedule that you can really define here. So I would simply go back to my fundamental expectation, which is we paid in advance for a service, and now it’s time for us to – for you to execute that service. And you know it needs to be within reason when our need is. And so, if the GTCC is available and packaged in 2005, in your recent scenario, then I would expect to be trying to arrange its disposal.

Id. at 160.

The plaintiff cannot have it both ways. It cannot defend its causation model – which, as illustrated by the chart in PX 104, includes no GTCC acceptance (Tr. 336) – while at the same time contending that \$1.2 million in GTCC should have been picked up by 2005. The testimony presented at trial does not demonstrate by a preponderance of the evidence that SCE’s one canister of GTCC would have been accepted during the damages period. While we agree with the government on this point, we cannot overlook the inconsistencies in its own arguments. The government’s assertions relative to SCE’s GTCC storage claim reinforce our earlier conclusion that the impact of GTCC on DOE’s SNF acceptance obligations in this case were minimal at best.

Government-Requested Offsets: SNF-Loading and Related Activities

A. Offset Theory

We now consider a series of arguments made by the government in the majority of SNF cases tried to date. In the same vein as the questioned overhead expenses, the defendant argues that certain *direct* costs associated with the ISFSI project are not incremental to the breach because they would have been incurred by SCE in any event.

In other words, SCE's mitigation activities have *avoided* certain "non-breach world" requirements. Certainly, this is the case where the ISFSI actually results in a cost savings to SCE. For example, the SCE voluntarily deducted \$3,757,908 representing certain expenses associated with maintaining SONGS Unit 1 SNF in SAFSTOR condition in the spent fuel pools. Tr. 10; 59; see PX 138 (Summary of Unit 1 SAFSTOR Offset Calculation). Assuming DOE performance under the 1987 ACR rates, plaintiff would have incurred the cost of storing SNF in the spent fuel pools for an additional 10 months, from September 2004 through June 2005. Joint Stip. ¶ 40. Due to the availability of dry storage in the real world – with the construction of the ISFSI – SCE did not. *Id.*; see also Tr. 134-40 (Reilly); Tr. 603 (Cowell).

The injured party in a breach of contract case is "not entitled, through the award of damages, to achieve a position superior to the one it would reasonably have occupied had the breach not occurred." *LaSalle Talman Bank v. United States*, 317 F.3d 1363, 1371 (Fed. Cir. 2003); *Bluebonnet Savings Bank v. United States*, 339 F.3d 1341, 1344-44 (Fed. Cir. 2003). Based upon this well accepted principle, the defendant contends that any damages awarded SCE should be offset by over \$10 million to account for the costs of future DOE loading (\$6,510,558), training (\$3,210,634), spent fuel characterization (\$420,573), and treatment of failed fuel (\$336,000). DDX 4 at 35; DDX 2 at 16.

B. Avoided Costs

Throughout trial, the defendant repeatedly pointed out certain mitigation efforts that mirrored SCE's future contractual responsibilities. According to the defendant, the fact that plaintiff has already performed these tasks – even if it did so only to mitigate against the DOE's partial breach – avoids the expenses associated with carrying out its obligations at a later date when the DOE performs its end of the bargain. One of the three government experts, Mr. Sander Levin, explained the methodology as "an incremental subtraction of specific activities." Tr. 997. Specifically, Mr. Levin contended that a pro rata deduction could be arrived at for the portion of loading, training, fuel characterization and failed fuel handling that the utility would have been responsible for in a contract performance scenario.

In September 2004, the plaintiff completed loading 207 spent fuel assemblies, previously stored in SONGS Unit 1 spent fuel pool, onto the ISFSI. Joint Stip. ¶ 35. Subsequently, SCE loaded onto the ISFSI additional Unit 1 assemblies, which had been stored in the SONGS Unit 2 and Unit 3 spent fuel pools. *Id.*; Tr. 196-99. As part of the ISFSI-loading operation, SCE was required to inspect and characterize spent fuel destined for dry storage. Moreover, SCE packaged the SNF into specially designed canisters, rated for storage and transportation.

The Standard Contract contemplated that the utilities would assume responsibility for loading SNF into dry storage canisters and preparing the canisters for transportation to the permanent repository. Pursuant to the Standard Contract:

The Purchaser shall arrange for, and provide, all preparation, packaging, required inspections, and loading activities necessary for the transportation of SNF and/or HLW to the DOE facility. The Purchaser shall notify DOE of such activities sixty (60) days prior to the commencement of such activities.

Standard Contract, art. IV(A)(2)(a); JX 2. It was also the utility's obligation to determine the characteristics of the SNF prior to loading the fuel into the DOE-approved canister. *Id.* at art. VI.B.2; see also, Tr. 1057-1058 (Zabransky) and Tr. 399-400 (Myers). SCE was required to dispose of non-standard fuel and failed fuel, which we will address momentarily. Standard Contract, art. VI.A.2(b). Had DOE timely accepted SNF, therefore, SCE would have performed the spent fuel characterization analysis and the subsequent loading at its own cost. The Standard Contract further contemplated that the purchaser-utility would provide its personnel certain training to aid in these tasks. Tr. 1069-71 (Zabransky); *but see*, Standard Contract, art. IV.B.2(b) (DOE's training responsibilities in cask handling and loading).

The plaintiff has carried out many of these same responsibilities – including the inspection, preparation and containment of SNF into dry storage casks – but for storage at the ISFSI. See Joint Stip. ¶ 42 (stipulated costs of spent fuel characterization and failed fuel canisters). Under the optimistic view, the plaintiff will someday unload the casks from the ISFSI and present them “as is” to DOE for permanent storage in Yucca Mountain. As the defendant noted at trial, SCE purchased transportable storage canisters in order to store SNF at ISFSI, with the expectation that the fuel could be transported to DOE without being repackaged. Tr. 56 (opening statement); Tr. 198-202 (Reilly cross-examination).

The government argues, therefore, that any mitigation damages awarded should be offset to account for these so-called avoided costs. Relying upon Dr. Neuberger's estimated number of casks loaded, and upon Mr. Sander Levin's testimony concerning the type and costs of the cask that might be used in the event of DOE performance, accountant/ consultant, R. Larry Johnson calculated the hypothetical future costs of loading 40 casks from GE Morris (\$1,592,730), 30 casks from SONGS Unit 1

(\$2,502,534), and 9 casks from SONGS Units 2 and 3 (\$2,415,294). The resulting DOE loading adjustment, according to the government, is \$6,510,558. Tr. 1220-24; DDX 4 at 34.

Notwithstanding the defendant's efforts to quantify SCE's potential costs savings, the figures are not relevant, at least not in a partial breach scenario where contract performance is still anticipated. Recently, the Court of Appeals considered the issue and effectively closed the door on the avoided costs offset theory. *See Carolina Power II*, 573 F.3d at 1277. Not only did the Court reject the argument that cask loading costs have been avoided in this and other cases, it agreed with the trial court's conclusion that allowing the government's proposed offset "would effectively require utilities to pay loading costs twice." *Id.*

C. Uncertainty as to Future Requirements

The foundation of the government's argument crumbles in the face of the uncertainty attendant in the government's future performance of the Standard Contract – not to mention the real world certainty of its non-performance. For example, after storing SNF in dry storage casks, SCE may ultimately have to re-load SNF into new casks that DOE provides. After all, the Standard Contract contemplated that DOE, not the Purchaser, "shall arrange for, and provide, a cask(s) and all necessary transportation of the SNF and/or HLW from the Purchaser's site to the DOE facility." Standard Contract, art. IV(B)(2). Indeed, the testimony was in conflict as to whether SCE's dry storage casks would satisfy the DOE's requirements for transportation to and permanent storage in the proposed Yucca Mountain facility. The government's representative from DOE's Office of Waste Management candidly admitted that the casks intended for this purpose had not yet been manufactured, nor had their specifications been released. DOE envisioned separate fleets of transportation casks for SNF and HLW, and yet the agency reserved the right to impose the NRC's specific requirements on the utilities at the time of acceptance. *See* Tr. at 1064, 1113-15 (Zabransky). Consequently, SCE was compelled to make the best out of the technology available at the time of the breach. As SCE's officers explained at trial, the company determined the most economical and safe course of action was to fabricate the casks in-house, at approximately \$1 million per canister. Tr. 201-02 (Reilly). This approach shielded the company from the problems one may expect in dealing with a private vendor, including supply and quality assurance concerns. *Id.* at 206-07.

Mr. Levin, a consultant expert witness who neither represents DOE nor implements the department's policy, assured the Court that these dry storage casks were suitable for rail-loading. In his view, SCE was well ahead of the game as a result of the dry storage operations it had been forced to pursue. Mr. Levin was also satisfied that the training required to work with the as yet undeveloped DOE casks would be similar to training SCE had already conducted in order to load SNF into dry storage canisters for the ISFSI. Tr. 1002-03.

The government argues that because of work on the dry storage project, SCE personnel will be sufficiently trained when and if the “DOE responsibilities” provision is triggered. Accordingly, defendant argues for a deduction of \$3,210,634 in expenses for training SCE’s employees to perform the mitigation project.

Even if we assume that the real world training necessitated by DOE’s breach would be similar to SCE’s training responsibilities in the non-breach world, a turnover in personnel and additional training will be required when DOE ultimately commences performance sometime after the year 2020. Tr. 1112-13 (earliest projected date for completion of Yucca Mountain repository). Furthermore, the plaintiff has no guarantee that the state of training in 2005 and earlier will prove adequate for DOE’s purposes in 2020 and beyond. As Mr. Morales testified, “I don’t know what equipment DOE will come up with, but in my experience, the training will have to be specific to whatever technology DOE delivers for loading their casks.” Tr. 486.

The government’s position respecting the cask characteristics suffers from a similar defect. Mr. Zabransky admitted under cross-examination that “DOE has not committed to supply any particular casks to the [SCE] site for acceptance of spent nuclear fuel,” nor has it committed to accept SCE’s dry storage casks for these purposes. Tr. 1113-14. Prior to trial DOE had not even identified the types of casks it might supply for performance. Tr. 1114. Nor could they predict so far in advance the regulatory requirements NRC might impose. *Id.* Mr. Reilly, who at the pertinent time served as SCE’s Vice President for Engineering and Technical Services, also did not share Mr. Levin’s confidence, as he detailed the types of costs SCE was likely to incur when DOE accepted its SNF from the ISFSI:

Well, while the canisters are suitable for shipment, they have to have a shielding cask, so that the shielding cask has to be dealt with and the canisters loaded into them and then whatever has to be done, and there, again, I have no idea what it is because we don’t know what it is.

But it would have to be secured for transport and lids put on and whatever work has to be done to load the canister in that cask and make it suitable for shipment would have to be done, whatever it is.

Tr. 142; *Compare* Tr. at 192-93 (assuming similarities between DOE loading and ISFSI loading).

When cross-examined about his accounting of avoided costs, another of the government’s expert witnesses, forensic accountant R. Larry Johnson, admitted that he did not make any adjustment for potential future loading costs. Tr. 1237-38. He demurred when pressed for an answer on future compliance issues and the arrival one day of DOE-supplied canisters: “It requires omniscience that I don’t have ..”. Tr. 1237. No statement better describes the shortcomings of the defendant’s avoided costs theory. This court has rejected proposed offsets similar to those at issue here. The government

cannot meet its burden where, as here, “the costs it seeks to offset are cask-specific.” See *Energy Northwest*, 91 Fed. Cl. at 553 (Notwithstanding evidence based on characteristics of “proxy” casks, court found that “it is improperly speculative to conclude that [plaintiff] will not incur these costs once the authorized DOE cask is identified and DOE performs under the contract.”); *Carolina Power I*, 82 Fed. Cl. at 52 (“Defendant has failed to present any evidence showing with reasonable certainty what [p]laintiffs’ loading costs would have been had DOE performed.”); *Tenn. Valley Auth.*, 69 Fed. Cl. at 542 (finding that purported benefit to plaintiff “because of delayed loading costs would be entirely speculative.”); *PG&E I*, 73 Fed. Cl. at 416 (“[T]he 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.”).

It is certainly possible that DOE might ultimately accept SCE’s SNF for shipment directly from the ISFSI in its present state, without further training and inspection, and without requiring the use of canisters specifically designed for permanent geologic disposal. Mr. Reilly was the first to admit that accepting the existing canisters would be the easiest thing to do. Tr. 200-01. However, this approach might require formally amending the Contract. And we must not ignore the fact that the nuclear waste program operates in a highly regulated environment. It is more likely that the SCE will be required to reload the SNF into a future type of cask DOE supplies for shipment of the cargo to its ultimate destination. DOE itself acknowledged, when forwarding its SNF Verification Plan, that “due to the uncertainties inherent in the long-term nature of the OCRWM program, it may be necessary to modify the Verification Plan to reflect evolving regulatory or other circumstances.” Cover Letter to DOE SNF Verification Plan (May 19, 1997), DX 60 at SCE021520.

In the end, these avoided costs are all associated with government performance at Yucca Mountain. We now know what we only surmised before – Yucca Mountain is no longer a possibility. Whatever alternative is ultimately selected may impose obligations on the plaintiff far different than the mitigation efforts involved here. Without government performance, there are no costs to be avoided.

We, therefore, conclude that the plaintiff’s production of storage casks, loading activities, fuel characterization, and related training do not justify a reduction of damages. These efforts were not expended in compliance with the contract; they were mitigative steps necessitated by safety and regulatory concerns, due entirely as a result of DOE’s breach. To conclude otherwise would require us to speculate in the face of reality. See *Dominion Resources*, 84 Fed. Cl. at 278 (Plaintiffs’ mitigation merely creates temporary on-site storage. It does not substitute performance.”). Plaintiff’s “ongoing contractual obligation has not yet matured under the terms of the contract itself.” See *Yankee II*, 536 F.3d at 1280 (ruling that utility’s one-time payment under Standard Contract should not be considered an offset for damages award). As Mr. Reilly testified, the company’s “costs have simply been postponed to a later time ... [SCE] will have to do whatever is required when DOE does show up to load casks.” Tr. 141. We heard similar testimony by other SCE managers, including Jorge Morales

and Paul Myers. See Morales testimony at Tr. 484-86 (insisting that fuel characterization and associated training was specific to the ISFSI project and not a proxy for the requirements of DOE loading) and Myers testimony at Tr. 432 (DOE has never committed to take SCE's loaded canisters).

Never during the course of trial, or at any other time, has the government promised to relieve SCE of its specific contractual obligations in return for assuming these costs now. As Mr. Reilly testified, "those costs have simply been postponed to a later time ... [SCE] will have to do whatever is required when DOE does show up to load casks." Tr. 141. Nor has the government offered to compensate the plaintiff for future loading-related costs, if it turns out that the ISFSI dry storage efforts do not obviate the need to prepare and package SNF for acceptance in accordance with as yet unestablished standards. The defendant's expert accounting witness, Mr. Johnson, agrees that the plaintiff should only have to pay for loading once, but suggests that SCE should pay for those costs now and perhaps be reimbursed if it incurs additional expenses when DOE ultimately performs. Tr. 1238-39. In sum, the government's expert concedes that "there might be some adjustment that would result prospectively." *Id.* at 1238. Yet the defendant has not explained how such an adjustment might operate to protect the plaintiff.

Nearly every trial court to have considered the avoided cost argument, has ruled as we do today. See *Energy Northwest*, 91 Fed. Cl. at 553; *Dominion Resources*, 84 Fed. Cl. at 278-79; *Carolina Power I*, 82 Fed. Cl. at 52; *Sys. Fuels, Inc. v. United States*, 79 Fed. Cl. 37, 70-71 (2007); *Sys. Fuels*, 78 Fed. Cl. at 797; *Northern States Power*, 78 Fed. Cl. at 468-69; *Southern Nuclear*, 77 Fed. Cl. at 450-51; *PG&E I*, 73 Fed. Cl. at 416; *Yankee I*, 73 Fed. Cl. at 286; *SMUD I*, 70 Fed. Cl. at 372; *Tenn. Valley Auth.*, 69 Fed. Cl. at 542.

We conclude that the SCE is entitled to its costs of fabricating the casks. It is also entitled to the labor costs, including training, associated with loading the SNF into the casks and moving them to the ISFSI. Finally, the seemingly routine task of characterizing the fuel prior to loading it for storage is treated in the same manner. See *Dominion Resources*, 84 Fed. Cl. at 279 ("We view fuel characterization costs conceptually similar to costs for loading fuel ... When DOE provides delivery, plaintiffs will incur these inspection costs again."). Due to the passage of time or the increasing likelihood of a change in circumstances, SCE must operate under the assumption that its fuel will have to be re-inspected when DOE finally performs its obligations under the Standard Contract.

D. Non-standard Fuel and Failed Fuel

In addition to the offsets described above, the government has raised certain issues respecting SCE's non-standard fuel and failed fuel. As we discuss below, special rules apply to these categories of SNF. As a result, the timing of DOE acceptance could, hypothetically, be delayed, thus affecting SCE's causation model. At a minimum,

the government contends that SCE is responsible for any special handling requirements and, therefore, the plaintiff's damages should be offset accordingly.

(i.) *Non-standard Fuel*

Non-standard fuel refers to the length of the fuel assembly. The SONGS 2 and 3 plants used fuel with an active length which was approximately 6 inches longer than that defined in the standard contract as "standard fuel." Apparently, the use of this type of fuel design was common among newer plants, which purchased their fuel from the same manufacture, Combustion Engineering. Tr. 88. DOE had been working through regulatory channels to revise the definition of standard fuel to include the added active fuel length. See Proposed Rule, 49 Fed. Reg. 6500 6501 (Feb. 22, 1984) (not codified); JX 3. Pursuant to the Standard Contract, "DOE's obligation for disposing of SNF under this contract also extends to other than standard fuel." Standard Contract, art. VI(A)(2)(b). However, there is an added step when nonstandard fuel is involved. The utility is required to "obtain delivery and procedure confirmation from DOE prior to delivery," after which DOE will, within 60 days, advise as to the technical feasibility of disposing of such fuel on the agreed to schedule. *Id.*

The government has conceded that the Standard Contract covers this variation in fuel type. There was absolutely no evidence at trial suggesting that the disposal of fuel used by SONGS 2 and 3 was technically infeasible. Mr. Zabransky confirmed at trial that the Combustion Engineering fuel used by SCE and other utilities would meet all regulatory requirements for disposal. Tr. 1075-77; Tr. 1135-36. Therefore, the potential schedule adjustment referenced in art. VI(A)(2)(b) would likely never arise. Any impact of these fuel assemblies on scheduling is largely hypothetical. Moreover, this issue only applies to the SONGS 2 and 3 SNF. The damages at issue in this trial predominately involve the older SONGS 1 SNF. Accordingly, there is no causation issue respecting non-standard fuel.

(ii.) *Failed Fuel*

The term "failed fuel" refers to SNF assemblies in which there exists "a structural deformity, cladding damage, or other defect" which requires the fuel to be handled separately. DX 185 at 29 (Levin Expert Report); see *also* Myers Testimony, Tr. at 281 ("[U]sually, it's fuel that's been identified to have pinhole leaks, or hairline cracks, or worse."); Zabransky Testimony, Tr. at 1077-78. Failed fuel assemblies are identified through spent fuel characterization. As we have already described, this procedure is required of every assembly when it is taken out of the reactor or the spent fuel pool and broken down for transportation to DOE's permanent geological repository – or in this case when the assemblies are placed into the ISFSI for storage. The SONGS 1 plant had a small amount of failed fuel. According to Mr. Myers, there were 28 failed fuel assemblies loaded in the ISFSI during the claim period. Tr. 282; *but see* Levin Expert Report, DX 185 at 29 ("SCE identified a total of 27 Unit 1 failed fuel assemblies.")

As with non-standard fuel, the Standard Contract gives DOE discretion to adjust the acceptance schedule for failed fuel. The government argues in this case and in others that failed fuel assemblies would not have been accepted in the same manner and in accordance with the same rate as other SNF. Of course, the failed fuel would ultimately be accepted by DOE under the terms of the contract. Assuming full performance by the government, however, when these canisters are opened and it is discovered that the assemblies are defective, any modifications or special packaging necessitated by the character of the fuel would be the responsibility of SCE, not DOE. Therefore, in addition to the impact on causation, the government argues that plaintiff's damages should be offset by \$336,000 to account for the costs of procuring failed fuel canisters. DDX 4.

According to Mr. Levin's report, "NRC regulations required utilities to properly encapsulate their failed fuel whether destined for an ISFSI, or delivery to DOE in a transportation cask." DX 185 at 29. Mr. Levin's opinion appears to be supported by official established procedures, such as the following:

Damaged fuel is placed inside a damaged-fuel-can ("canned") prior to loading into a dry storage or transportation cask. The can must be individually removable from the cask using normal fuel handling methods (crane and grapple).

Id. (Citing NRC interim staff guidance document). As with the other offsets on which Mr. Levin opined, the training, fuel characterization and special packaging associated with failed fuel involve costs that should be borne by the utility, since these costs would have been incurred in the event of full performance by DOE.

Mr. Myers conceded that the causation analysis did not, in fact, account for possible delays in DOE's acceptance of SCE's failed fuel. Tr. 282. However, the testimony adduced at trial does not affect causation nor does it support the government's reduction in damages. According to Mr. Myers, failed fuel assemblies were merely placed into solid metal containers with the added protection of a mesh interior to trap the contents of any assembly that might come apart due to its defect. *Id.* Beyond that "nothing special [was] required." *Id.* at 283. Similarly, Mr. Reilly testified that "other than inserting [failed fuel] in the can," no special handling was necessary. Tr. 130. Mr. Zabransky admitted on cross-examination that assuming DOE succeeded in obtaining the proper licensing, "[t]here should be no reason for delays," in accepting failed fuel along with standard SNF. Tr. 1138.

Finally, in this case, the failed fuel was "canned" not for transportation to Yucca Mountain, but for placement in dry storage. Moreover, there is no telling whether the failed fuel canisters used will ultimately be acceptable for permanent storage. DOE has yet to provide specifications for the failed fuel canisters, as they are required by the

Standard Contract. Standard Contract, art . IV(B)(2)(a); Tr. 239-40 (Myers); Tr. 1137 (Zabransky). For the same reasons cited above with respect other ISFSI expenses, we do not believe that SCE's containment of failed fuel constitutes an avoided cost.

The defendant's failed fuel arguments have been rejected in earlier SNF trials. See *PG&E I*, 73 Fed. Cl. at 400 (finding that no special handling was required for failed fuel, thus requiring DOE to accept failed fuel at the same time as its SNF/ HLW under the Standard Contract); *Yankee I*, 73 Fed. Cl. at 311 (plaintiffs "canistered" their failed fuel without special handling equipment). Based on these cases, and on the evidence presented at trial, we are not persuaded that the treatment of failed fuel in the non-breach world would require extraordinary measures. It would have been identified through the fuel characterization process – which we have already held is a deferred, not an avoided, cost – and packaged for acceptance and disposal by DOE. There is no evidence that in the nonbreach world SCE's delivery schedule would have been affected by the presence of failed fuel. Nor is there any basis to offset SCE's damages to account for the costs of failed fuel canisters.

CONCLUSION

As a result of the defendant's partial breach of the Standard Contract, SCE has been forced to come up with alternative storage for its SNF and HLW, build a dry storage facility, and purchase and load special casks onto the facility. It has incurred extensive damages, both in direct expenses and in overheads associated with these mitigation activities. We find in favor of the plaintiff on all but a small percentage of the damages it has claimed, summarized as follows.

The Court awards SCE the damages associated with storing SNF off-site at GE Morris. The undisputed evidence supports damages in the amount of **\$26,827,548** for off-site storage.

As illustrated below, SCE has requested approximately \$81.5 million in damages related to the SONGS Unit 1 ISFSI and approximately \$39.6 million in damages for the SONGS Units 2 and 3 ISFSI. The plaintiff is entitled to the costs of building and maintaining the ISFSI's, including the overhead expenses summarized below (representing Common Allocation, Internal Market Mechanism, Corporate A&G, security and insurance). However, the requested damages are reduced by the stipulated amounts for GTCC storage and AFUDC, recovery of which is **DENIED**.

The damages for ISFSI-related activity are further reduced by SCE's voluntary deduction for costs avoided as a result of the plaintiff's mitigation. The plaintiff conceded that it erroneously included 10 months of SAFSTOR costs for SONGS Unit 1 SNF assemblies. SCE would have expended **\$3,757,908** to store assemblies in the spent fuel pool prior to acceptance under 1987 ACR. However, the utility avoided the SAFSTOR costs by transporting the assemblies to dry storage.

Unit 1 ISFSI Costs

• Construction	\$ 61,981,761
• Overheads	\$ 19,544,212
• GE Morris Storage	\$ 26,827,548
• GTCC Storage	(\$ 1,260,771)
• SAFSTOR Cost Offset	(\$ 3,757,908)
	<u>\$103,334,842</u>

Units 2 and 3 ISFSI Costs

• Construction	\$35,551,467
• Overheads	\$ 4,113,579
• AFUDC	(\$ 605,594)
	<u>\$39,059,452</u>

The government requested additional offsets in the amount of **\$10,477,765**, representing: DOE loading (\$6,510,558); fuel characterization (\$420,573); failed fuel (\$336,000); and training (\$3,210,634). However, the defendant failed to establish that the damages should be reduced as a result of these activities.

Finally, SCE sought to recover **\$2,088,656** for its investment in PFS. Recovery of these damages is **DENIED**.

The Clerk of Court is directed to order final judgment in accordance with the Court's findings above, and award plaintiff \$142,394,294 in damages. Parties are to bear their own costs.

IT IS SO ORDERED.

s/ Lawrence M. Baskir
LAWRENCE M. BASKIR
Judge

Southern California Edison Co. v. United States, 04-109C
1987 RCR Canadian Analysis

Year	1984	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017				
MORRIS																																					
U1 Assemblies Shipped to DOE				207	53																																
U1 RTU Shipped to DOE				762	182																																
U1 Assembly Inventory	270	270	270	59	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SONGS UNIT 1																																					
U1 Assemblies Shipped to DOE																																					
U1 RTU Shipped to DOE																																					
U1 Assembly Inventory	207	207	207	207	207	207	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163	
SONGS UNIT 2																																					
Assemblies Discharged	108	100																																			
U1 Assemblies Shipped to DOE																																					
U2 Assemblies Shipped to DOE																																					
U1 RTU Shipped to DOE																																					
U2 RTU Shipped to DOE																																					
U1 Assembly Inventory	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70		
U2 Assembly Inventory	700	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	
Total Fuel Inventory (Assemblies) (U1 + U2)	770	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870		
Unavailable Spares (Assemblies) *	11	16	16	16	16	17	17	17	17	17	17	17	18	18	22	22	22	22	22	22	22	20	19	19	19	19	19	19	19	19	19	19	19	19			
Margin over FCRI (Assemblies) *	544	479	479	479	479	398	246	246	246	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141			
SONGS UNIT 3																																					
Assemblies Discharged	108		100																																		
U1 Assemblies Shipped to DOE																																					
U2 Assemblies Shipped to DOE																																					
U1 RTU Shipped to DOE																																					
U2 RTU Shipped to DOE																																					
U1 Assembly Inventory	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118		
U2 Assembly Inventory	700	700	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	
Total Fuel Inventory (Assemblies) (U1 + U2)	818	818	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918	918		
Unavailable Spares (Assemblies) *	14	14	17	17	17	17	18	18	18	18	18	18	18	18	22	22	22	22	22	22	22	20	19	19	19	19	19	19	19	19	19	19	19	19			
Margin over FCRI (Assemblies) *	483	483	682	682	682	583	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268	268		
Total Assemblies Shipped to DOE																																					
Total U1 Shipped to DOE	0	0	0	207	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Total U2 Shipped to DOE	0	0	0	762	182	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Total DOE Fuel Asset Allocation	0	0	0	764	183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

* Unavailable Spares are reported after search outage on the Nuclear Fuel Service Change Report.
* Margin over FCRI is calculated as follows: Fuel Capacity - Fuel Inventory - Unavailable Spares

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