

In the United States Court of Federal Claims

No. 12-641C

(Filed: October 6, 2016)*

*Opinion originally filed under seal on September 20, 2016

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ENTERGY NUCLEAR PALISADES,)	
LLC,)	Spent Nuclear Fuel; Breach of
)	Contract; Reasonable Mitigation
Plaintiff,)	Efforts; But-For Causation
)	
v.)	
)	
THE UNITED STATES,)	
)	
Defendant.)	
_____)	

TRIAL OPINION

L. Jager Smith, Jackson, MS, for plaintiff. *Eric B. Landley*, *Robin F. Bromberg*, and *Adam K. Israel*, Birmingham, AL, of counsel.

Alexis J. Echols, Civil Division, United States Department of Justice, Washington, DC, with whom where *Benjamin C. Mizer*, Principal Deputy Assistant Attorney General, *Robert E. Kirschman, Jr.*, Director, and *Allison Kidd-Miller*, Assistant Director, for defendant. *Jane K. Taylor*, United States Department of Energy, and *Sarah Choi* and

FIRESTONE, *Senior Judge*.

This lawsuit is one of a number of cases arising out of the failure of the defendant, the Department of Energy (“DOE” or “government”) to perform its contractual obligations to remove spent nuclear fuel (“SNF”) from nuclear power plants, including plaintiff Entergy Nuclear Palisades, LLC (“Entergy”), which operates the Palisades nuclear power plant located in Covert, Michigan. The Nuclear Waste Policy Act

("NWPA") of 1982, codified as amended at 42 U.S.C. §§ 10101-10270, called for DOE to enter into agreements under which nuclear power plants would pay the government to take SNF from the plants and put the SNF in a long-term storage facility in Yucca Mountain, Nevada. Though the NWPA and Entergy's contract, DE-CR01-83NE44374 for Disposal of Spent Nuclear Fuel and/or High Level Radioactive Waste (the "Standard Contract") required the government to begin accepting SNF on January 31, 1998, to date, the DOE has not accepted any SNF from Palisades or any other plant, and has no immediate plans to do so. Over the life of the contract, Entergy and its predecessor in ownership, Consumers Power Company ("Consumers"), have paid approximately \$279 million in fees to the DOE.

This is the second case that has been filed concerning the government's breach of the Standard Contract with respect to the Palisades plant. Consumers entered into the Standard Contract in 1983. When the government failed to abide by its obligations under the Standard Contract, Consumers sued the DOE to recover the costs of its efforts to mitigate the damages caused by the government's failure to accept any SNF, including constructing and maintaining two long-term SNF storage facilities, known as independent spent fuel storage installations ("ISFSI"), at the Palisades plant. In 2005, this court held that the government had breached the Standard Contract when it failed to begin accepting SNF in 1998. Consumers Energy Co. v. United States, 65 Fed. Cl. 364, 375 (2005). Consumers and the government settled the previous litigation in 2011. In 2007, Consumers sold Palisades to Entergy and, with the government's consent, assigned the Standard Contract to Entergy.

In this lawsuit, Entergy is seeking to recover costs it incurred to mitigate the government's breach between the time it acquired Palisades on April 11, 2007 through June 30, 2013 (the "claims period"). The government agreed that it was liable to Entergy for approximately \$20.6 million of the \$36.1 million Entergy sought in this litigation. On May 18, 2015, the court entered partial judgment against the government in that amount. Order of Judgment, ECF No. 65.

Thereafter, the court held a seven-day trial in December 2015, at which thirteen witnesses testified, with regard to the amount of damages still in dispute. After the trial had concluded, the government conceded that, following the Federal Circuit's decision in System Fuels, Inc. v. United States, 818 F.3d 1302 (2016), Entergy was entitled to recover an additional \$3,504,856. For the reasons set forth below, the court finds that Entergy has established damages in the amount of \$13,828,676, including the \$3,504,856 the government conceded it owed to Entergy post trial.

I. BACKGROUND

A. Stipulations

Prior to trial, the parties entered into stipulations of fact in which the government agreed that, while it did contest that Entergy was entitled to recover certain costs, it did not contest that Entergy actually incurred the amounts claimed, other than the amount claimed for security at the second ISFSI. The government also stipulated that, with respect to any payroll loaders associated with Entergy's claims, the government would not challenge the calculation of the payroll loader rates and agreed that if a claimed damage category is recoverable, the associated payroll loaders are also recoverable.

B. Summary of Entergy's Damages Claims

At trial, Entergy presented evidence with respect to three broad categories of damages, discussed below. The government, in turn, presented evidence in support of its argument that Entergy would have incurred many of these costs even if the government had not breached the Standard Contract.

1. Spent Fuel Pool Modifications

During the claims period, Entergy expended \$10,359,120 to replace deteriorating racks, located in the spent fuel pool at Palisades, which hold SNF immediately after the fuel is removed from the reactor.¹ Of this amount, Entergy spent \$677,399 to remove fuel rods that had become trapped in the old racks after parts of the racks had swollen and \$9,681,721 for the new set of racks. At trial, Entergy's witnesses testified that if the government had timely picked up spent fuel in accordance with the Standard Contract, Entergy would have been able to manage the deteriorating racks problem and would not have needed to replace them because there would have been less fuel in the pool. The government presented evidence to show that the racks were defective and Entergy would have replaced them even if the government had performed. Further, the government argues that the decision to replace the racks was not a reasonable mitigation effort as compared to other solutions.

The court finds that Entergy would not have undertaken the re-rack project had the government not breached the contract. However, the court finds that the plaintiff did not meet its burden with respect to the cost of removing stuck fuel assemblies from the spent

¹ The total cost of the re-rack project was approximately \$18.4 million.

fuel pool during the rack replacement project because Entergy would have had to remove the stuck assemblies even if the government had performed under the contract.

2. Dry Fuel Storage Costs

Entergy initially claimed that it is entitled to recover \$24,436,531 for costs related to loading the SNF into dry storage canisters and constructing the second ISFSI for long-term dry storage of SNF at Palisades. The government has already paid \$19,957,483 in this case for this category of damages. The bulk of the remaining \$4,480,048 of damages related to the labor costs associated with loading the SNF into dry fuel storage casks for long-term storage, and the corresponding payroll loaders. At trial, the government claimed that Entergy had not met its burden of showing that the government's breach caused these damages. However, following the Federal Circuit's decision in System Fuels, Inc. v. United States, 818 F.3d 1302 (2016), which held that the government is liable for the cost of loading SNF into on-site dry fuel storage because that effort would not have been undertaken but for the government's breach, the government conceded that Entergy was entitled to an additional \$3,504,856 in dry fuel storage loading costs.²

The government still disputes that Entergy is entitled to \$387,301 in welding contractor standby costs associated with cask closure activities and \$558,030 Entergy

² Entergy originally included a claim for an invoice for \$15,254, which, according to Entergy, was mistakenly labeled as relating to a diesel generator but was in fact associated with dry cask procurement. However, in their initial post-trial brief, Entergy represented that they are no longer pursuing compensation with respect to that claim. Pl.'s Post-Trial Brief ("PTB"), ECF No. 142 at 1-2. In addition, Entergy initially sought an additional \$12,845 in damages attributable to a delay in the plant's 2008 dry fuel storage campaign. However, Entergy has now conceded that it did not sufficiently prove up its damages relating to the delays in the 2008 campaign.

paid to lease equipment for several weeks while the loading campaign was delayed. The court finds that the government is not liable for the delay costs associated with Entergy's dry fuel storage efforts because the additional expenses came as a result of Entergy's errors and thus Entergy broke the chain of causation between the government's breach and Entergy's mitigation efforts.

In addition, the government disputes Entergy's claim for \$12,496 associated with structural analysis of part of the Palisades plant known as the "track alley." Entergy presented testimony that the structural review was part of the transition to a new dry cask storage system and is thus attributable to the government's breach. The government counters that Entergy would have had to perform the structural analysis as part of Entergy's routine maintenance, and therefore this cost was not caused by the government's breach. The court finds that the analysis was performed as part of the plant's dry fuel storage campaign and thus Entergy is entitled to recover this cost.

3. Security Costs

Finally, Entergy presented evidence to show that it was providing full time security at the second ISFSI, which would not have been constructed had the government performed. Entergy's witnesses testified that there were two posts dedicated to the second ISFSI and both posts were staffed around the clock, as required under Nuclear Regulatory Commission ("NRC") regulations. Entergy claims that it incurred \$1,306,316 staffing the two posts around the clock during the claims period.

At the partial summary judgment phase, the government agreed to pay \$676,713 in additional security costs, representing its calculation of the cost of staffing one of the two

posts at the second ISFSI. Entergy claims it is entitled to an additional \$629,603 for the cost of staffing the second post. The government contends that Entergy has not provided sufficient evidence to show that Entergy actually staffed both posts at all times. Further, the government argues that Entergy has failed to prove these damages because Entergy's total security costs did not increase by the amount that Entergy calculated that it cost to staff the two posts during the claims period. The court finds that Entergy established its right to recover \$677,399 in security costs associated with guarding a facility for storing spent nuclear fuel.

II. APPLICABLE LAW

The plaintiff's burden for establishing damages in a SNF case, where, as here, the government's liability for breach is established, is well settled. In order to recover the costs of mitigating the government's breach, a plaintiff must prove that the cost incurred was caused by the government's breach of the Standard Contract and that the cost would not have been incurred in a "but-for" world in which the government did not breach the contract. Yankee Atomic Elec. Co. v. United States, 536 F.3d 1268, 1273 (Fed. Cir. 2008). In that connection, the plaintiff bears the burden of showing what its financial condition would be absent the government's breach. Id. (citing Glendale Fed. Bank, FSB v. United States, 239 F.3d 1374, 1380 (Fed. Cir. 2001); Bluebonnet Sav. Bank FSB v. United States, 67 Fed. Cl. 231, 238 (2005)). Further, the plaintiff's damages must have "been reasonably foreseeable by the breaching party at the time of contracting" and the plaintiff must show damages "with reasonable certainty." Id. (quoting Ind. Mich. Power Co. v. United States, 422 F.3d 1369, 1373 (Fed. Cir. 2005)).

III. FINDINGS OF FACT AND CONCLUSIONS OF LAW

A. Entergy has Established that the Re-Racking the Spent Fuel Pool Was a Result of the Government's Breach

As noted, the bulk of Entergy's damages claim is \$10,359,120 it incurred during the claim period in connection with the spent fuel pool re-rack project, which includes both the replacement of the Carborundum racks and the liberation of assemblies that had become stuck in the racks. The parties largely agree on the sequence of events. See Joint Supp. Stips., ECF No. 112. However, the parties disagree as to whether Entergy would have replaced the racks in a but-for world in which the government performed its obligations to take SNF from the Palisades plant.

1. Undisputed Facts Regarding the Replacement of the Carborundum Racks

The reactor at the Palisades plant uses uranium fuel pellets that are stacked into long metal tubes called "fuel rods." Joint Supp. Stips. at ¶ 1. The fuel rods are placed into an array called an "assembly." The reactor core at Palisades holds 204 fuel assemblies. Id. Approximately once every eighteen months, one-third of the assemblies are "discharged" and removed from the core. Id. at ¶ 2. Palisades also undergoes periodic inspections approximately every ten years (most recently in 2014) in which it removes all of the assemblies from the core, a process known as a full-core offload. See id. at ¶¶ 5, 16, 20. The discharged assemblies, or SNF, must be stored for a period of time in submerged racks in a special pool known as a "spent fuel pool" designed to cool the assemblies and protect workers and the environment from radiation. Id. at ¶ 2.

The spent fuel pool at Palisades contains racks designed in a grid formation creating individual “cells.” Each cell is intended to hold one fuel assembly, keeping all assemblies a set distance from each other. The racks at issue in this litigation were installed in 1977 and increased the pool’s capacity from 272 cells to 798 cells which could theoretically each contain one assembly. Id. at ¶ 6. The racks contained the neutron-absorbing material Carborundum. Id. at ¶ 7. In 1987, half of the Carborundum racks were replaced with higher capacity racks containing Boraflex, a different neutron absorbing material, which increased the pool’s capacity from 798 to 892 cells. Id. at ¶ 8. The racks installed in 1987 are referred to as “Region II” racks, while the remaining racks installed in 1977 are known as “Region I” racks. Id. at ¶ 9.

Though the Carborundum panels inside the cell walls of the Region I racks were intended to help control radioactive criticality of the spent fuel pool, the Carborundum degraded over time generating a gas that damaged the racks. Id. at ¶¶ 7, 10. The gas caused swelling in fourteen cells, eleven of which contained spent assemblies that became stuck, making those cells unavailable for storing newly discharged assemblies. Id. at ¶ 10-11. After Entergy purchased the Palisades plant from Consumers in 2007, Entergy conducted tests on the Carborundum racks and concluded that the racks had degraded to an extent that they were no longer absorbing neutrons. See id. at ¶ 28 (testing in 2008 confirmed Carborundum degradation). In 2008, Entergy determined that, as a result of the Carborundum degradation, the pool was no longer in compliance with NRC criticality requirements, as set forth in 10 C.F.R. § 50.68. Id. at ¶ 29. As a result, Entergy was required to amend its license with the NRC. Id. at 30-32.

Under Entergy's amended license, which went into effect on February 6, 2009, Entergy no longer took credit for Carborundum as a neutron absorber in the spent fuel pool for the purposes of the pool's criticality analysis. Id. at ¶ 33-35. In addition, the modified license required Entergy to leave every other cell in Region I empty, arranging the assemblies in a "checkerboard" pattern in which half of the cells contained no assembly. Id. The fuel assemblies stuck in the swollen cells further restricted the total number of assemblies Entergy could load into the pool and the ways in which the assemblies could be arranged. Id. In January of 2012, the NRC approved a second license amendment, "Amendment 246," which allowed assemblies to be stored in two-out-of-four, three-out-of-four, and four-out-of-four patterns depending on depletion of the fuel assemblies. Tr. 247:11-13, 249:3-11 (Wiggins); PDX 3 (Wiggins) at Slide 27, 29.

In 2011, Entergy entered into a contract with Holtec International to replace the Region I Carborundum racks with racks using a neutron absorbing material called "Metamic," instead of Carborundum. Joint Supp. Stips. at ¶ 12. The re-rack of Region I of the Palisades spent fuel pool was completed in 2013. Id.

2. The Evidence at Trial Establishes that Entergy would not have Re-Racked Region I of the Spent Fuel Pool Absent the Government's Breach

Though Entergy acknowledges that the racks were problematic even before the government breached the Standard Contract, Entergy asserts that the plant would not have replaced the Carborundum racks had the DOE begun accepting SNF in 1998. Entergy presented evidence, which the government did not dispute, that there would have been fewer fuel assemblies in the spent fuel pool if the government had not breached the

Standard Contract than there were in the actual world at the time that Entergy decided to replace the racks, and the number of assemblies in the pool would have continued to decrease over time. By contrast, in the actual world, the number of assemblies in the pool will continue to increase. Entergy's witnesses testified, and the court agrees, that if there had been fewer assemblies in the spent fuel pool, Entergy could and would have worked around the problems with the existing Carborundum racks in accordance with its amended NRC license until the plant was decommissioned.

Guy "Tom" Wiggins, a reactor engineer at Palisades, testified that primary reason Entergy decided to re-rack the spent fuel pool was because the space restrictions in the spent fuel pool made it so that Entergy did not have enough available cells to perform a full-core offload. Tr. 257:9-12 (Wiggins).³ Entergy was required to perform a full-core offload in January of 2014 in association with its 10-year service inspection. Tr. 226:20-227:12; 362:16-17 (Wiggins). However, because of the 2009 amendments in Entergy's license, Entergy could only store assemblies in half of the cells in Region I due to the Carborundum degradation. Tr. 247:11-13 (Wiggins). The spacing requirement was relaxed in 2011 under Amendment 246 to allow fuel to be stored in two-out-of-four, three-out-of-four, and four-out-of-four patterns depending on how depleted the fuel was in the assembly, with more burned-up fuel stored closer together and less burned-up fuel

³ Mr. Wiggins has worked at Palisades for the past fifteen years. His duties include monitoring reactor core performance, new fuel receipt, spent fuel-related activities, including spent fuel pool-related engineering, support for dry fuel storage activities, outage support for moving fuel, support for maneuvering reactor operations, and other engineering duties, including special nuclear material control. Tr. 215-218 (Wiggins). He received a B.S. in Nuclear Engineering from North Carolina State in 1987. Tr. 213:23-25 (Wiggins).

spaced farther apart. Tr. 249:3-11 (Wiggins); PDX 3 (Wiggins) at Slide 27, 29.

However, Mr. Wiggins testified that even under Amendment 246, there still would not have been enough space to perform a full-core offload. Tr. 250:4-251:16. (Wiggins).

Mr. Wiggins explained that in preparation for the scheduled full-core offload, Entergy underwent a Kepner-Tregoe (“KT”) analysis, in which various potential options for addressing a problem are given a score reflecting their positive and negative attributes, to determine how to best address the lack of space in the spent fuel pool. Tr. 252:3-10 (Wiggins); PX 594 (KT Decision Analysis). The objectives of the analysis, from most weighted to least weighted, included: maximizing fuel storage capacity; minimizing adverse impact on outage schedule; minimizing O&M cost; minimizing personnel exposure; minimizing complications to technical specifications; minimizing capital cost; minimizing rack damage during stuck assembly removal; minimizing licensing change requirements; and minimizing radioactive waste. PX 594 at 2. In the KT analysis, Entergy considered re-racking Region I; re-racking the entire spent fuel pool; increasing dry fuel storage; or doing nothing, and determined that re-racking Region I was the best solution. Id. at 1.

Though increasing Entergy’s dry fuel storage efforts to increase room in the spent fuel pool was considered, the KT team rejected that option for several reasons.

According to Entergy’s findings, Entergy would have had to load four to five additional casks as part of the 2011 loading campaign on top of the six casks it intended to load during that campaign in order to remove enough fuel to restore full-core offload capability for the 2014 inspection. PDX 3 (Wiggins) at Slide 32; PX 597 (Spent Fuel

Storage at Palisades Power Point) at 4-5. That would bring the total number of assemblies that Entergy would have to identify as qualifying for dry fuel storage up to approximately 224. PX 597 at 5. The KT team found that identifying 224 qualifying assemblies would require a major ultrasonic testing campaign, and even with such a campaign, it might not have been possible to qualify 224 assemblies as being sufficiently burned off and cooled to be placed in dry fuel storage. Id. Entergy found that even if that many assemblies could be identified, removing all of those assemblies from the pool at once could result in a shortage of assemblies that had sufficiently cooled down for the 2017 dry fuel storage campaign. Id. Mr. Wiggins testified that the situation was further complicated by the fact that the pool contained 55 “stranded assemblies,” which, according to Mr. Wiggins, could not be stored in Region II due to insufficient burn-up and did not qualify for dry fuel storage due to cladding defects. Tr. 250:14-21, 251:2-5, 274:25-275:7 (Wiggins); PDX 3 at Slide 30.

Further, Entergy concluded that even if it increased its dry storage campaign to restore full-core offload ability for the required 2014 inspection, Entergy would likely lose full-core offload ability again in the near future as newer, hotter fuel was added to the pool. PX 597 at 5 Though Entergy was not required to be able to fully offload its core at all times, having that ability is preferable because, as Entergy project manager William Harper explained, “no nuclear station in the country ever wants to be in a position that they can’t offload their core completely if they needed [to] perform any kind of emergent maintenance or emergent repair during [a] refueling outage.” Tr. 454:11-

455:16 (Harper). For these reasons, Entergy decided that replacing the racks was the best option.

Mr. Wiggins further explained that if the DOE had performed, re-racking would not have been necessary because there would have been fewer assemblies in the pool at the critical juncture leading up to the 2014 full-core offload, and that Entergy would have expected the number of assemblies in the pool to continue to decline in the future.

Compare PX 185 with PX 183. Mr. Wiggins testified that there were 204 assemblies in the reactor core, which, under Amendment 246, would have to be spaced out across 342 cells. Tr. 258:9-22 (Wiggins). Mr. Wiggins testified that had the DOE begun accepting SNF from Palisades, it would have accepted fuel at a higher rate than Entergy had been putting fuel into dry storage, and would have accepted 53 of the 55 stranded assemblies that Entergy could not put into dry storage.⁴ In the non-breach world, there would have been 422 cells available in Region I, leaving 80 cells still open to accommodate any remaining stranded assemblies that the DOE could not remove and any recently discharged fuel that did not qualify for Region II. Tr. 258:9-22 (Wiggins). Mr. Wiggins concluded that “[h]ad DOE been performing, Entergy management would not have approved a capital project such as this that would have – could have been avoided, and we would not have had to perform the re-rack.” Tr. 271:7-10 (Wiggins).

⁴ Mr. Wiggins testified that the DOE would have accepted 53 of the stranded assemblies, because, while they did not meet Entergy’s requirements for dry storage, did not fall within the Standard Contract’s Appendix E definition of damaged or failed fuel that could not be handled by normal means. Tr. 257:17-24 (Wiggins). The remaining two stranded assemblies were stuck in the cells, and therefore Mr. Wiggins “assume[d] they would not be shipped to DOE.” Tr. 157:12-24 (Wiggins).

The government's expert, Gregory A. Maret, did not contradict Entergy's calculations of how many assemblies would have remained in the spent fuel pool at Palisades in the non-breach world compared to how many assemblies were in the pool in the actual world.⁵ Nor did Mr. Maret contest Entergy's assertion that the number of assemblies in the pool would have continued to decline if DOE had followed the schedule in the Standard Contract. Tr. 1062:21-1064:15 (Maret). Mr. Maret also did not contradict Entergy's assertion that had the DOE performed, Entergy could have continued to operate with the existing racks in conformity with its amended licensing requirements, including the full-core offload in 2013. Tr. 1111:6-13 (Maret). Instead, the government argues that Entergy would have replaced the racks absent the government's breach, or, alternatively, that Entergy's decision to re-rack the pool instead of using additional dry fuel storage to increase the pool's capacity was unreasonable.

Mr. Maret testified that Entergy would have decided to replace the Carborundum racks regardless of the breach because the Carborundum racks were highly undesirable in that they had stopped absorbing neutrons and would continue to degrade further, and, as a result, the pool required continued monitoring to maintain desirable criticality levels. Tr. 983:2-987:1; 996:2-18 (Maret). In addition, the government argues that additional cell wall swelling would continue to be an unpredictable problem and asserted that it was

⁵ Mr. Maret has over 30 years' experience in nuclear engineering and operations of nuclear reactors, and has been responsible for the decommissioning of nuclear power plants, including dry and wet fuel storage. DX 182 (Maret Rep't).

“highly unlikely that [Entergy] would have continued to operate with the unpredictable cell wall swelling caused by the defective Carborundum racks.” Def.’s Resp. 5-6.

The court does not find Mr. Maret’s opinion persuasive because, in the real world, Entergy had been working around the problems with the Carborundum racks without replacing them until Entergy ran out of space in the pool to perform a full-core offload. As discussed, Entergy had been operating the pool without taking credit for any of the Carborundum’s neutron absorbing capability through spacing out assemblies across more cells. Therefore, the court agrees with Entergy that Carborundum degradation, or the potential for additional Carborundum degradation, was not a sufficient reason in and of itself for Entergy to undertake a capital project of this magnitude.⁶ The court also disagrees with the government’s assertion that concerns over more assemblies becoming stuck in the racks was the reason for Entergy’s decision to re-rack the spent fuel pool. Although the evidence established that since 1988, a total of eleven assemblies had periodically become trapped in swollen cells, most recently in 2007, Joint Supp. Stips. ¶¶ 7-11, the evidence also established that Entergy had been aware of the cell swelling

⁶ Further, the government suggests that the rate of Carborundum degradation may have been more rapid in the non-breach world because had the DOE performed, there would have actually been more assemblies in the racks (and thus more radiation potentially leading to Carborundum degradation) until 2008 because Entergy moved assemblies into dry storage before the DOE would have picked them up in the but-for world. See Tr. 305:25-307:-13 (Wiggins). However, the court finds that the rate of degradation would not have affected Entergy’s decision making process. Both the government and the plaintiff acknowledge that a correlation between increased radiation and more rapid Carborundum degradation has not been established. See Tr. 451:8-22 (Harper); Tr. 925:10-16 (Woody); Tr. 1001:16-1003:3 (Maret). More importantly, as discussed above, Entergy had ascertained that the Carborundum panels were no longer absorbing neutrons and had been successfully managing the pool without taking credit for any Carborundum absorption. Joint Supp. Stips. ¶¶ 28-29.

problem for more than twenty years, and had not replaced the racks. See Tr. 268:21-269:2 (Wiggins). Further, the government's expert estimated that there would be approximately one additional stuck assembly per decade, which would result in only two more stuck assemblies before the plant is decommissioned. Tr. 1021:1-11 (Maret). The court thus agrees with Entergy that this relatively small number of potential additional stuck assemblies was not a sufficient reason to re-rack the spent fuel pool.

The court is also not persuaded that additional dry fuel storage would have been a more reasonable mitigation response than re-racking the spent fuel pool. Mr. Maret testified that the 55 "stranded" or damaged assemblies could in fact have been loaded into dry fuel storage had Entergy used a different type of cask. Tr. 1007:11-1008:12 (Maret). According to the government, in order to regain full-core offload capability for the 2014 inspection, Entergy would have had to load two additional casks, which, based on the amount it cost Entergy to load and procure casks during the 2011 loading campaign, would have increased the cost of that campaign by \$4,308,588. Def.'s Reply 6 (citing Tr. 109:24-110:7, 120:2-11, 133:17-134:11, 156:19-158:21 (VanWagner); DX 59 at KRG-PAL011706-37; DX 95; J. Mot. to Amend Damages Chart (ECF No. 118-1) at 1). The government argues that because this expense is significantly lower than the approximately \$18.4 million total cost of the project (approximately \$10 million of which was incurred during the claims period), the re-rack was not a reasonable mitigation choice.

The court is not persuaded that the fact that Entergy could have, at least in the short term, regained full-core offload capability through additional dry fuel storage makes

Entergy's decision to re-rack the pool an unreasonable choice. First, the government's comparison of approximately \$18.4 million for the re-rack compared to \$4.3 million to load additional casks is misleading. The \$18.4 figure includes approximately \$4.7 million (\$677,399 of which accrued during the claims period) attributable to liberation of the fuel assemblies that had become trapped in the swollen cells. DX 233 at 5; Tr. 439:21-441:4 (Harper). As discussed below, the court has found that Entergy cannot recover those costs. Further, even assuming that Mr. Maret is correct and only two additional casks would have been required to regain full-core offload capability, as opposed to the four or five additional casks estimated by Entergy, the court cannot assume that it would cost the same amount to procure and load dry storage casks for the "stranded" or damaged assemblies as it did to procure and load other casks during the 2011 dry fuel storage campaign. Mr. Wiggins testified that the stranded assemblies were damaged and would have had to have been placed in special damaged fuel canisters. Tr. 250:14-21, 251:2-5, 274:25-275:7. Accordingly, the court cannot assume that it would cost the same amount to procure and load dry storage casks for the "stranded" or damaged assemblies as it did to procure and load other casks during the 2011 dry fuel storage campaign.

Second, the court finds that it was reasonable and proper for Entergy to take other factors, in addition to cost into account when deciding to re-rack the pool. As the KT team found, re-racking the pool "provide[d] a permanent solution to the problem where as several of the other options provided only temporary solutions." PX 599 at 11.

William Harper, Entergy project manager, Suzanne Leblang, former Entergy project

manager, and Tom Woody, former Entergy reactor engineer, testified that, by re-racking, and replacing the Carborundum racks with racks containing Metamic as the neutron absorber, Entergy was able to regain flexibility and predictability in its spent fuel pool and increase storage capacity. Tr. 453:9-16 (Harper); Tr. 882:18-885:5 (Leblang); Tr. 931:19-934:23 (Woody). In addition, the court finds that Entergy was correct to conclude that if it increased its dry fuel storage efforts to regain full offload capacity, the plant would likely lose that capacity soon after as more spent assemblies were added to the pool. See PX 597. Accordingly, Entergy’s decision to find a permanent solution to the additional space problem created by the government’s breach was well-justified. See Tr. 454:11-455:16 (Harper) (finding that “no nuclear station in the country ever wants to be in a position that they can’t offload their core completely if they needed [to] perform any kind of emergent maintenance or emergent repair during [a] refueling outage.”); see Boston Edison Co. v. United States, 93 Fed. Cl. 105, 116 (2010), aff’d in part, rev’d in part and remanded, 658 F.3d 1361 (Fed. Cir. 2011) (finding that a plant’s “re-racking costs were not attributable to a speculative venture . . . but rather resulted from the implementation of a plan deemed to be the most technologically practical and financially sound way to mitigate the damage from DOE’s breach (citations omitted)).⁷

⁷ Further, it should be noted that if Entergy had elected to do additional dry storage, the government would have been required to pay for that effort. See System Fuels Inc. v. United States, 818 F. 3d 1302 (2016). The court does not want to create an incentive for nuclear plants, which will be repeat players in this type of lawsuit, to elect less efficient solution that they are certain the government will pay for over better and more effective solutions.

Accordingly, the court finds that if the government had performed, there would have been fewer assemblies in the pool at the critical juncture when Entergy was preparing to perform a full-core offload in 2014. With fewer assemblies, Entergy would have been able to operate with the existing racks, and would have continued to work around the problems with the racks. Further, the court finds that Entergy's decision to re-rack Region I of the spent fuel pool instead of increasing dry fuel storage was a reasonable choice to mitigate the government's breach.

3. Entergy Failed to Establish that the Liberation of Stuck Fuel Assemblies was Caused by the Government's Breach

In addition to the costs of installing new racks, Entergy is also claiming \$677,399 for the cost of liberating 11 fuel assemblies that had become stuck in the pool's Carborundum racks because of swelling in the cell walls. The government argues that even if Entergy is entitled to the costs of replacing the Carborundum racks, Entergy should not be able to recover the costs of liberating the stuck assemblies because under the Standard Contract, Entergy was required to prepare the assemblies before DOE removed the SNF from Palisades. Accordingly, the government argues that its breach was not the but-for cause of this expense because Entergy would have had to liberate the stuck assemblies if the government had performed under the contract.

Entergy argues that had the government performed, there would have been enough space in the spent fuel pool to leave the stuck assemblies in place until the plant decommissioned. Tr. 269:5-271:10 (Wiggins). Therefore, had the government performed Entergy would not have incurred the cost of removing the stuck assemblies

during this claims period. However, Entergy did not dispute the government's assertion that Entergy would have had to liberate the assemblies from the racks at some point at its expense if the government had performed.⁸ Because the government was not responsible for the assemblies being stuck in the racks, and because removing the stuck assemblies would have been Entergy's responsibility had the government performed, the court finds that Entergy failed to show that the cost of removing the stuck assemblies from the racks was caused by the government's breach. As such, Entergy is not entitled to the costs incurred for removing these assemblies.

B. Costs Related to Entergy's Long-Term Dry Storage of SNF at the Palisades Plant

1. Entergy is Entitled to the Cost of Loading SNF into Dry Fuel Storage Canisters

Following the System Fuels decision, the government stated in its post-trial briefing that it no longer contests that Entergy is entitled to recover \$3,504,856 in damages related to the SNF loading campaigns. The court therefore finds that Entergy is entitled to recover the agreed amount of damages as a result of the government's breach.

2. The Government is Not Liable for Costs of Unexplained Delay or Delay Attributable to Entergy's Error

Though the government is no longer contesting that Entergy is entitled to recover the above-noted amount of damages in connection with the SNF loading campaigns, the government still disputes that Entergy is entitled to \$945,331 of the costs Entergy

⁸ At oral argument, Entergy suggested that the costs of removing the stuck assemblies would have been less if Entergy had waited until the plant is decommissioned, however, there was no evidence to that effect at trial.

incurred during the 2011 loading campaign as a result of that campaign being delayed for approximately six weeks beyond Entergy's initial estimate. The costs of the delay include \$387,301 in welding contractor standby costs paid to the contractor PCI Energy and \$558,030 in standby costs for equipment that Entergy had leased from the contractor Transnuclear. The government states that these additional costs were either caused by Entergy's errors or unexplained, and therefore not proximately caused by the government's breach. Entergy counters that the delays and associated costs were reasonable and foreseeable consequences of the government's breach.

The Federal Circuit has held that a plaintiff may not recover damages that "could have been avoided by reasonable efforts." Robinson v. United States, 305 F.3d 1330, 1333 (Fed. Cir. 2002) (quoting Restatement (Second) of Contracts § 350, comment b (1981)). In this connection, "[t]he breaching party has the burden to prove that mitigation efforts were unreasonable." Sacramento Mun. Util. Dist. v. United States, 70 Fed. Cl. 332, 370 (2006); see also Sacramento Mun. Util. Dist. v. United States, 293 F. App'x. 766, 772 (Fed. Cir. 2008) ("It is the Government's burden to show that it was unreasonable for SMUD to pursue dual-purpose storage canisters to mitigate the Government's breach"); Old Stone Corp. v. United States, 450 F.3d 1360, 1370 (Fed. Cir. 2006) (noting that only mitigation efforts that are "fair and reasonable under the circumstances" are recoverable, but finding that "the government has not shown that it was unreasonable" for plaintiff to act as it did (citations omitted)); Tenn. Valley Auth. v. United States, 69 Fed. Cl. 515, 523 (2006) ("In putting forward its defenses to TVA's claims, the government bears a concomitant burden of proof. To eliminate or reduce

TVA's mitigation-related damages, the government bears the burden of showing that TVA's mitigation efforts were unreasonable."'). The question before the court is therefore whether the government has shown that the delays in Entergy's 2011 dry fuel loading campaign could have been reasonably avoided.

At trial, Bob VanWagner, senior project manager at Entergy in charge of the 2011 loading campaign, testified that Entergy planned to begin the 2011 cask loading campaign on September 26, 2011, and anticipated that the campaign would be completed on November 4, 2011. Tr. 145:6-17 (VanWagner), see PX 981. To prepare for the campaign, Entergy leased equipment from Transnuclear, the company that produced the dry fuel casks Entergy was loading in the 2011 campaign, at a rate of \$93,005 per week. Tr. 187:1-158:5 (VanWagner). Entergy received the equipment on September 12, 2011. Id. In addition, Entergy mobilized the contractor PCI to provide labor for the loading campaign at a daily rate of \$7,950 beginning on September 18, 2011. Tr. 159:19-161:13. However, the campaign did not commence until October 11, 2011. Tr. 145:12-17 (VanWagner). On cross-examination, Mr. VanWagner stated that he did not recall what caused the delay in the start date. Tr. 146:1-3 (VanWagner).

In addition to the delay in beginning the loading campaign, Mr. VanWagner testified the campaign was further delayed because of "incorrect programming of a fuel handling machine." Tr. 122:11-14 (VanWagner). Mr. VanWagner testified that Entergy loaded SNF into canisters provided by Transnuclear in both its 2008 and 2011 loading campaigns. Tr. 185:21-188:1 (VanWagner). However, between the 2008 and the 2011 campaigns, there was a change in the measurements of an element of the canister known

as a “fuel spacer,” which is designed to keep the assemblies at the correct height within the canister. Tr. 187:12-18 (VanWagner). Mr. VanWagner explained that the fuel spacer is approximately two feet long, and the difference between the 2008 and 2011 measurements was approximately 3/16 of an inch. Tr. 188:2-17 (VanWagner). However, given the “very tight parameters” for handling SNF, the difference in the fuel spacer’s measurement was significant enough that Entergy’s fuel handling machine had to be reprogrammed. Tr. 188:18-24 (VanWagner). According to Mr. VanWagner, Transnuclear did not bring the change in the canister design to Entergy’s attention and no one at Entergy realized the fuel spacer length had changed. Tr. 186:23-188:22 (VanWagner). These delays pushed the campaign into the Thanksgiving and Christmas holidays, which further delayed the campaign. Tr. 153:12-20 (VanWagner). The campaign ultimately ended on December 15, 2011, Tr. 155:1-3 (VanWagner), six weeks after the scheduled end date of November 4, 2011. At trial, Mr. VanWagner testified that in his opinion, the delay was not abnormal and could have been anticipated:

As the project manager, you know, I expect some delays. You do everything you can to get prepared, but there are things we can’t control—equipment failures, weather in the case when we’re outside trying to insert one of those canisters, those sort of things, because the instruments are so sensitive. I don’t consider, at least in my opinion, the delays experienced as a result of the fuel handling machine as unreasonable, the costs associated with that.

Tr. 122:19-123:2 (VanWagner).

The government contends that it is not liable for the costs attributable to the delays in the 2011 loading campaign because the delays were caused by Entergy’s own errors and therefore were not a reasonably foreseeable result of the government’s breach. In

this connection, the government relies on the testimony of Mr. Van Wagner who did not recall the reason for the start delay and conceded on cross-examination that the delay resulting from the program error was an “Entergy-caused delay,” Tr. 160:9-12 (VanWagner). Further, the government notes that had Entergy followed the guidelines in its own dry fuel storage management manual, Entergy could have established that there had been a change in the measurements of Transnuclear’s fuel spacer. The manual, dated October 14, 2010, states:

5.3 Spent Fuel/Dry Cask Loading Preparation Phase

Prior to and during the spent fuel loading preparation phase, the Project Manager [for Dry Fuel Storage] shall assemble a multi-disciplined project team and develop and implement an integrated work plan for performance of the following activities:

- ...
- [9] Incorporation of cask design change activities, which include:
- (a) Reviewing cask completion documentation packages to identify applicable cask design changes and deviation reports.
 - (b) Reviewing cask vendor design changes and deviation reports.
 - ...
 - (d) Coordinating any design change conflicts with the vendor.
 - (e) Incorporating the vendor design change through the fleet design or procedure change process, where appropriate.

PX 948 at 12, 15. Entergy’s manual therefore anticipated that a vendor such as Transnuclear may have modified the design of a cask system and specifically instructed the project manager to discuss and review design changes with the vendor during the preparation phase of the spent fuel loading campaign. Further, the government notes that the same manual states that “[c]onsideration should be given to performing a Dry Run at the beginning of every campaign in an effort to minimize [radiation] dose and gain operational efficiency prior to the commencement of the loading campaign.” Id. at 18.

However, there was no dry run performed for the 2011 loading campaign. Tr. 150:7-9 (VanWagner).

With respect to the two-week delay in the beginning of the campaign, the court must conclude that the delay was not reasonable when Entergy's witness could not give an explanation as to why delay occurred.⁹

Further, the court finds that the government has met its burden of showing that the delay costs caused by Entergy's failure to note the change in the fuel spacer measurements were not reasonably foreseeable because, had Entergy followed its own protocols, the delay could have been avoided. At the time of the 2011 loading campaign, Mr. VanWagner was the Senior Manager for dry fuel storage and the person ultimately responsible for understanding the cask design specifications. PDX 2, Slides 3-5 (VanWagner); Tr. 149:5-12 (VanWagner). However, Mr. VanWagner stated that he did not review the documentation detailing the cask specifications provided by Transnuclear, which Mr. VanWagner acknowledged contained the correct measurements for the fuel spacer. Tr. 149:1-18 (VanWagner). Instead, the documents were reviewed by the fabrications engineer, who did not discover the change. Tr. 149:16, 188:25-189:13 (VanWagner). Though the change in measurements may have been small, it was evidently very significant when applied to the handling of nuclear material, which is

⁹ Entergy's claims for damages incurred during delays in loading campaigns initially included \$12,845 in damages attributable to a delay in the plant's 2008 dry fuel storage campaign. However, Entergy has now conceded that it did not present any evidence at trial concerning the cost of the 2008 delay. Pl.'s Resp. 22 n. 9. Therefore, the court concludes that Entergy has not sufficiently proved that it is entitled to recover these costs.

precisely why Entergy's manual instructed the program manager to review design changes with the vendor.

In this regard, the court rejects plaintiff's contention that this case is similar to another SNF case, Yankee Atomic v. United States, 113 Fed. Cl. 323 (Fed. Cl. 2013), in which the court found that damages from an imperfect mitigation effort were nevertheless recoverable. In Yankee Atomic, the plaintiff incurred costs above its initial estimates because during the course of a construction project, the plant terminated contractors that had been constructing an ISFSI and completed the construction itself. Id. at 332-33. The court rejected the government's argument that the increased costs were not reasonably foreseeable results of the government's breach, noting that under the government's preferred understanding of the law, "parties who are forced to mitigate would be unable to recover all reasonable mitigation costs unless the mitigation activity was carried out perfectly and went exactly as planned." Id. at 335. In Yankee Atomic, the plaintiff experienced setbacks that ended up increasing the plaintiff's mitigation costs beyond its initial estimate, but the plaintiff maintained, and the court found, that the decisions the plaintiff made were reasonable under the circumstances. In this case, the delay was not caused by a reasonable decision that turned out to be incorrect, but by Entergy's failure to follow its own protocols by having the project manager review any design changes with the vendor.

The court therefore finds that the costs attributable to loading delays either were not adequately explained could have been avoided by reasonable efforts and thus are not recoverable.

3. Entergy is Entitled to Damages Associated with its Structural Analysis of the Track Alley

The final category of damages associated with Entergy's 2011 dry fuel storage campaign concerns the \$12,496 Entergy incurred in undertaking a structural review of the "track alley," a large room within the Palisades original auxiliary building that was designed to bring heavy equipment into the building. Tr. 805:18-24 (Lyon).¹⁰ When Entergy transitioned from the NUHOMS dry fuel storage system to the Holtec system,¹¹ Entergy engaged the services of the CTL Group ("CTL"), which specialized in concrete structural analysis, to ensure the track alley could bear the weight of the casks. Tr. 808:3-20; 809:5-16 (Lyon). The government contends that this expense was not caused by the government's breach but instead was part of the building's routine maintenance.

The court finds that the evidence Entergy presented at trial is sufficient to show that the track alley review was necessitated by the government's breach and would not have occurred if the government had not breached the Standard Contract. At trial, Alan Lyon, a senior engineer in the design engineering group within the civil/structural/mechanical section at Palisades, testified that the work that CTL performed would not have been performed but for the transition from the NUHOMS system to the Holtec system. Tr. 815:6-11 (Lyon). In addition, Mr. Lyons testified that Entergy did not avoid any routine monitoring or maintenance, because the Palisades plant

¹⁰ This feature is called the "track alley" because it originally had railroad tracks leading to the building. Tr. 805:18-806:3 (Lyon).

¹¹ The Holtec and NUHOMS systems were part of the dry fuel storage projects that Entergy put in place to store the SNF after the government's breach.

already conducted structures monitoring of the same structures that CTL was hired to analyze. Tr. 817:23-818:2-17 (Lyon).

The government states that Entergy's own testimony confirms that the outside review of the track alley would have had to have been performed regardless of the government's breach because the concrete degradation was a safety concern. Def.'s PTB 32. However, as Mr. Lyon testified, Entergy was already aware of the general safety problems through their own internal monitoring system, and is not seeking compensation for repairs of the track alley. Mr. Lyon testified that CTL was hired to resolve a "relatively specialized analytical problem" by evaluating "the structure for any potential degradation that's occurred; also, to verify that the—the work that was being done analytically matched the design of the plant" in association with the transition from NUHOMS to Holtec casks, 809:1-810:12 (Lyon), and therefore did not abrogate the need for the Palisades internal structures monitoring program, which was also conducted. The government has not presented any evidence to contradict Entergy's assertion that CTL's analysis was performed in addition to, not instead of, any routine monitoring or maintenance at Palisades. Consequently, the court finds that these costs are recoverable.

C. Entergy has Established it is Entitled to Recover for both Security Posts at the Second ISFSI

Entergy's claims for additional security arise from the need to guard the second ISFSI at the Palisades plant. The government agrees that the second ISFSI was constructed to store SNF at Palisades as a result of the government's breach, and has agreed to pay the cost of its design and construction. Joint Stips. at ¶ 11. Pursuant to an

agreement with the NRC, Entergy is required to staff two security posts dedicated to the second ISFSI 24 hours a day every day. Id. at ¶ 16.d. Of the \$1,306,316 in damages Entergy claims it incurred securing the second ISFSI during the claims period, the government has already agreed to pay \$676,713, which represents the amount that the government's expert calculated it would cost for Entergy to staff one of the two security posts (\$630,217), plus \$46,496 in NRC security and inspection fees associated with the second ISFSI. However, the government disputes an additional \$629,603 claimed by Entergy, which Entergy's expert calculated as the cost of staffing the second security post at the new ISFSI for two reasons. First, the government argues that Entergy failed to prove that the security posts were actually staffed twenty consistently since April of 2011. Second, the government argues that Entergy's trial testimony "does not establish that the commitment of two posts actually resulted in [Entergy] incurring incremental labor costs equal to the amount [Entergy] claims." Def.'s PTB 33.

With respect to the government's first argument, the court finds that Entergy has met its burden of proof to show that the security posts were consistently staffed. At trial, the security manager at the Palisades during the claims period, David Berkenpas, testified that since April of 2011, Entergy has staffed two posts dedicated to the second ISFSI around the clock every day. Tr. 515:20-2 (Berkenpas). Mr. Berkenpas testified that security personnel at Palisades rotated through security posts approximately every two hours to combat fatigue, and that every security officer would have rotated through the two ISFSI posts. Tr. 522:2-24 (Berkenpas); PDX 4 Slide 20. Mr. Berkenpas stated that while Entergy creates shift rotation schedules which assign security officers to each of

the posts for specific blocks of time during each shift, the schedules cannot be used to identify which security officer staffed a given post at all times during the claims period because the schedules are subject to change and are retained for only a few months. Id.; see DX 195 (example security schedule for Palisades).

The government argues that Entergy's evidence is insufficient to show that the posts were consistently staffed because Entergy was unable to demonstrate which employees were staffing each post at any given time. The government notes that on cross-examination, Mr. Berkenpas acknowledged that it would have been possible for officers to charge time spent monitoring the new ISFSI to a second work order, but that Entergy chose not to segregate time spent on the ISFSI from time spent on other security posts at Palisades. See Tr. 137:16-19 (Berkenpas).

The court finds that the uncontroverted sworn testimony of Entergy's security manager that Entergy complied with its obligations to the NRC and did in fact staff the two posts at the second ISFSI 24 hours a day, 365 days a year is sufficient proof that the posts were indeed staffed. Further, the court finds that Entergy was not required to produce evidence showing which security officer staffed each security post at all times during the two years the ISFSI was operational during the claims period. While collecting that data would have been possible, the court finds that it would have been costly and would not have had an effect on the security of the plant. Peter Sabo, the site finance manager at Palisades, estimated that he believed that changing the system to allow security officers to bill time specifically to the posts at the second ISFSI could cost as much as "three-quarters of a million dollars" and would not add value to the security

system. Tr. 503:20-504:8 (Sabo). Therefore, it was reasonable for Entergy to treat staffing records for the two new security posts just as it had treated the records for previously-existing posts.

The government also argues that Entergy's trial evidence did not establish that the commitment of two new security posts resulted in an increase in total security costs to the extent claimed by Entergy. The government's expert calculated that there was a slight increase in hours worked after the addition of the two new security posts, but not enough to account for the amount that Entergy claims in costs associated with the two security posts. At trial, Mr. Berkenpas calculated that staffing the two posts 24 hours a day every day beginning in April of 2011 required 17,520 on-post hours during the claims period. Tr. 520:2-19 (Berkenpas). Because each security officer rotated through the two posts, Entergy calculated the cost of those hours using an average labor rate for security officers, and concluded that required 9.3 full time equivalent employees ("FTEs") to staff the two posts during the claims period. Tr. 520:14-18, 522:14-22 (Berkenpas). Mr. Berkenpas explained that the total number of security personnel did not immediately increase at the time the two posts were dedicated because Entergy initially did not hire additional personnel to staff the posts at the second ISFSI, but instead relied on overtime, which stressed personnel resources. Tr. 517:18-23 (Berkenpas); PDX 4 Slide 13. Mr. Berkenpas testified that had the second ISFSI not been built, the "total security cost at Palisades would be lower by 9.3 FTE." Tr. 517:9-15 (Berkenpas).

The court finds that Entergy has sufficiently proved its labor costs. The Federal Circuit has found that "to recover internal labor costs incurred in mitigation of the

Government's breach, [a plaintiff] must prove that it did in fact use its own employees in its mitigation efforts, and the number of hours those employees spent on mitigation related projects." Sacramento Municipal Utility District v. United States, 293 F. App'x 766, 773 (Fed. Cir. 2008) (citing Dunn Appraisal Co. v. Honeywell Info. Sys., Inc., 687 F.2d 877, 883–84 (6th Cir. 1982)). Therefore, the premise of the government's argument—that plaintiff had to show that its overall security costs increased in order to recover the costs attributable to the government's breach—is contradicted by Federal Circuit precedent. The Federal Circuit has also rejected a similar argument with respect to overhead costs, dismissing the government's argument that overhead costs should not be awarded because the plaintiff could not show a total increase in overhead costs compared to the non-breach world. Energy Nw. v. United States, 641 F.3d 1300, 1308-09 (Fed. Cir. 2011).

In this case, the court has found that the evidence establishes that Entergy used its resources to staff two security posts at the new ISFSI all day every day and that Entergy would not have needed to secure the ISFSI but for the government's breach. See Sacramento Municipal, 293 F. App'x at 773 (finding that "an injured party can recover mitigation damages so long as it establishes that the claimed expenses were caused by the breach"). Further, the court finds that it was appropriate for Entergy to calculate its costs using an average rate because all of the security officers at Entergy rotated through the two posts. The fact that Entergy's total security costs did not increase by the amount Entergy ascribes to the government's breach could have been the result of any number of unrelated events at the Palisades plant, and does not prevent Entergy from recovering for

the time its employees indisputably spent guarding posts that would not have existed but for the government's breach.

Further, with respect to the amount that Entergy is claiming in damages for the cost of staffing each post, the fact that the government's calculation of the cost of staffing one post (\$630,217) was so close to the plaintiff's calculation (\$629,603) demonstrates that Entergy has fulfilled its obligation to show with "reasonable certainty that the awarded costs were actually caused by the breach." Entergy Nw., 641 F. 3d at 1309 (citation omitted). Therefore, the court finds that Entergy is entitled to recover the remaining \$629,603 in damages for securing the second ISFSI.

IV. CONCLUSION

For the reasons stated above, the court finds in favor of the plaintiff with respect to its claims for costs related to the replacing the rack in the spent fuel pool at Palisades; the dry fuel storage loading costs the government now agrees it owes Entergy; the review of the track alley; and the additional security costs. The court finds in favor of the government with respect to Entergy's claims for costs associated with the liberation of spent fuel assemblies and the standby costs associated with delays in Entergy's dry fuel storage campaigns. Judgment shall be entered in favor of Entergy in the amount of \$13,828,676.00.

IT IS SO ORDERED.

s/Nancy B. Firestone
NANCY B. FIRESTONE
Judge