In the United States Court of Federal Claims

No. 01-249C

(Filed: January 31, 2006)

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TENNESSEE VALLEY AUTHORITY,	)	Breach of standard contract for disposal of spent nuclear fuel; damages; mitigation; *Restatement (Second) of Contracts* § 350; scope of relief available for sequential partial breaches
Plaintiff,	)	
v.	)	
UNITED STATES,	)	
Defendant.	)	

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Peter K. Shea, Office of the General Counsel, Tennessee Valley Authority, Knoxville, Tennessee, for plaintiff. With him at trial and on the briefs was Edwin W. Small, Assistant General Counsel. Also with him on the briefs was Maureen H. Dunn, General Counsel, Tennessee Valley Authority, Knoxville, Tennessee.

Sonia M. Orfield, Trial Attorney, Commercial Litigation Branch, Civil Division, Department of Justice, Washington, D.C., for defendant. With her at trial and on the briefs were Alan Lo Re, Senior Trial Counsel, Sharon A. Snyder, Trial Attorney, and Kevin B. Crawford, Trial Attorney. Also with her on the briefs were Peter D. Keisler, Assistant Attorney General, David M. Cohen, Director, and Harold D. Lester, Jr., Assistant Director, Commercial Litigation Branch, Civil Division, Department of Justice, Washington, D.C.

OPINION AND ORDER

LETTOW, Judge.

This action is one of a series of cases pending before the Court involving contracts between the federal government and operators of the nation's nuclear electric utilities for the disposal of spent nuclear fuel. Plaintiff, the Tennessee Valley Authority ("TVA" or "Authority"), seeks damages for the failure of the Department of Energy ("DOE") to perform under a contract

("Standard Contract") executed between the parties in 1983 for the disposal of spent nuclear fuel ("SNF") and related materials generated at two nuclear power plants owned and operated by TVA – the Browns Ferry and Sequoyah nuclear plants.[1] As damages, TVA seeks costs incurred in building on-site dry storage facilities for the spent fuel that it otherwise would have transferred to DOE under the Standard Contract.

In a prior decision, this court granted a motion by TVA for a partial summary judgment that DOE breached its obligations to act in good faith on Delivery Commitment Schedules ("DCSs") submitted by TVA to DOE in accordance with the Standard Contract, and ultimately to accept, transport, and dispose of TVA's SNF as required by the Standard Contract. *Tennessee Valley Auth. v. United States*, 60 Fed. Cl. 665, 674 (2004). In that decision, however, the court denied TVA's motion for summary judgment insofar as it requested an award of damages because the government had not yet had an opportunity to conduct discovery specifically related to TVA's alleged damages, and the court therefore could not determine that no genuine dispute of material fact existed as to the amount of those damages or that TVA was entitled to those damages as a matter of law. *Id*. at 675-76. The court ruled that TVA necessarily had alleged and proven a partial breach of the Standard Contract, and that the Authority could seek damages based upon actual costs incurred in mitigating the partial breach. *Id*. at 679. In that respect, the court ruled that TVA could seek damages through the end of its fiscal year completed prior to the date of trial. *Id*. at 678-79.

To adjudicate the issues of fact respecting damages, the court conducted an 11-day trial commencing on June 21, 2005 and ending on July 15, 2005, initially in Chattanooga, Tennessee

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[1]In the Nuclear Waste Policy Act ("NWPA"), Pub. L. No. 97-425, Title III, § 302, 96 Stat. 2201, 2257 (Jan. 7, 1983) (codified at 42 U.S.C. § 10222), Congress authorized DOE "to enter into contracts with any person who generates or holds title to high-level radioactive waste, or spent nuclear fuel, of domestic origin for the acceptance of title, subsequent transportation, and disposal of such waste or spent fuel" in exchange for the payment of an initial fee followed by recurring fees. 42 U.S.C. § 10222(a)(1). Congress mandated that the country's nuclear plant operators, primarily electrical utilities, enter into such contracts with DOE as a prerequisite to maintaining their operating licenses. *Id*. at § 10222(b); *see also Maine Yankee Atomic Power Co. v. United States*, 225 F.3d 1336, 1337 (Fed. Cir. 2000) ("The [NWPA] effectively made entry into such contracts mandatory for the utilities."). DOE endeavored to establish standard terms for such a contract, and the Department undertook a rulemaking for that purpose. *See* 48 Fed. Reg. 5,458 (Feb. 3, 1983). It ultimately promulgated a Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste. 48 Fed. Reg. 16,590 (Apr. 18, 1983) (codified at 10 C.F.R. § 961.11) ("Standard Contract").

TVA was one of the active participants in DOE's rulemaking and urged DOE to specify a rate of pick up in the Standard Contract to enable utilities better to plan their arrangements for spent fuel storage DX 5.063 (TVA's unsigned comments), at 5. DOE did not adopt this suggestion, instead building a planning process into the contract for scheduling pick-ups of spent nuclear fuel. *See* Standard Contract arts. IV-V.

and subsequently in Washington, D.C. Post-trial briefs were filed thereafter, and a closing argument was held on October 27, 2005. The case is now ready for disposition.

For the reasons set forth below, the court finds that plaintiff is entitled to damages caused by the government's breach in the amount of $34,893,207 for the period beginning when it became apparent that DOE would not timely collect and dispose of TVA's SNF and ending at September 30, 2004, TVA's most recently closed fiscal year prior to the date of trial.

FACTS[2]

TVA and DOE entered into a Standard Contract for disposal of SNF in June of 1983. Tr. 62:23 to 63:3 (Test. of Thomas L. Hayslett, Jr., former Chief of TVA's Nuclear Fuel Supply Branch); JX 1 (Contract No. DE-CR01-83NE44420 (June 28, 1983) ("TVA Contract")).[3] TVA's Standard Contract covered SNF and waste produced at four of TVA's facilities – (1) Browns Ferry, a three-reactor facility which is located on the northern shore of Wheeler Lake in Limestone County, Alabama, (2) Sequoyah, a two-reactor facility which is located on the western shore of Chickamauga Lake in Hamilton County, Tennessee, (3) Watts Bar, a two-reactor facility which is located on the western bank of the Tennessee River in Rhea County, Tennessee, and (4) Bellefonte, a two-reactor facility which was to be located on the western bank of the Tennessee River in Jackson County, Alabama. JX 1 at 35-43 (TVA Contract Appendix A). In this action, TVA seeks damages related only to the Browns Ferry and Sequoyah plants. Tr. 10:24 to 11:10 (Pl.'s Opening Statement); TVA's Damages Trial Memorandum of Facts and Law ("Pl.'s Tr. Memo.") at 2.

One of the goals of the Nuclear Waste Policy Act ("NWPA") was to reduce the backlog of spent nuclear fuel that had accumulated at nuclear power facilities around the nation. Tr. 819:14-20 (Test. of Lake H. Barrett, deputy director of DOE's Office of Civilian Radioactive Waste Management). Another goal of the waste disposal program was to preclude utilities' need to provide for storage of spent fuel outside the pools attendant to their reactors. Tr. 1365:9 to 1367:10 (Test. of Thomas E. Pollog, technical representative of the contracting officer, DOE's Office of Civilian Radioactive Waste Management); DX 37 at 11 (Proceedings of the 1983 Civilian Radioactive Waste Management Information Meeting (Feb. 1984)).[4] To serve these

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[2]This recitation of facts constitutes the court's principal findings of fact in accord with Rule 52(a) of the Rules of the Court of Federal Claims ("RCFC"). Other findings of fact and rulings on questions of mixed fact and law are set out in the analysis.

[3]Citations to the trial transcript are to "Tr. __." Joint Exhibits are denoted as "JX," plaintiff's exhibits are denoted as "PX," and defendant's exhibits are denoted as "DX."

[4]These water-filled pools provide a storage area proximate to the reactor for fuel-rod assemblies that are being moved into and out of the reactor or are otherwise being stored on a temporary basis.

goals, DOE conducted a survey of utilities as part of its waste management program to determine the amount of spent fuel that had been accumulated to date, as well as the amount of fuel that was being generated annually. Tr. 910:21 to 912:6 (Test. of Pollog). DOE's analysis indicated that nuclear power plants nationwide would generate approximately 2,000 metric tonnes of uranium ("MTU") per year of new waste in the form of spent fuel. Tr. 833:20 to 836:7 (Test. of Barrett). To prevent utilities from exceeding their wet storage capacity as well as to reduce the backlog of waste, DOE determined that approximately 3,000 MTU would need to be collected by DOE each year (the 3,000 MTU rate allowed a catchup of 1,000 MTU per year to eliminate the spent fuel that had been accumulating before the startup of DOE's collection program). *Id*. at 833:20 to 835:19. This rate of 3,000 MTU became the baseline rate that was used by DOE when designing its repositories, and this number was set out in DOE's strategic plans. *See*, *e.g.*, PX 11 § 2.7 (Mission Plan for the Civilian Radioactive Waste Management Program (June 1985)). DOE also set the annual fees to be paid by utilities under the Standard Contract at a level consistent with a steady-state rate of 3,000 MTU per year. Tr. 74:15 to 75:13 (Test. of Hayslett). DOE expected that a "permanent" waste repository would require a transition period of approximately five years from the date it started operation until it could ramp up to the targeted rate of 3,000 MTU per year. Tr. 852:6 to 857:19 (Test. of Barrett).

Early in DOE's nuclear waste disposal program, DOE contemplated that it would open more than one repository for spent fuel and high-level waste ("HLW"). Tr. 1400:9 to 1402:16 (Test. of Christopher A. Kouts, Director of DOE's Office of Systems Analysis and Strategy Development). During the period of 1985-1987, however, DOE became concerned that it might miss its contractual obligation to begin accepting SNF and HLW by the end of January 1998. *Id.* at 1407:3 to 1426:13; PX 96 (DOE Fund Fee Adequacy: An Assessment (Feb. 1985)); PX 94 (DOE Analysis of the Total System Life Cycle Cost for the Civilian Radioactive Waste Management Program ("TSLCC") (Apr. 1986)). DOE proposed to Congress a plan whereby a monitored retrievable storage facility ("MRS") would be built to function in conjunction with a permanent repository. Tr. 1421:20 to 1426:5 (Test. of Kouts); DX 48 (Monitored Retrievable Storage Submission to Congress (Mar. 1987)). DOE contemplated that the MRS could begin accepting SNF and HLW from utilities by the contractual deadline of January 1998, even if a "permanent" repository had not been completed by that date. Tr. 1426:21 to 1427:22, 1431:24 to 1433:2 (Test. of Kouts). The MRS was also to serve another important purpose. It would act as a processing facility where SNF from utilities could be re-packaged for permanent storage before being sent to a permanent facility. It was envisioned that all SNF would first be shipped to the MRS for processing before being taken to a permanent repository, even after a permanent repository came on line. This would allow a permanent repository facility to be a simpler operation, with less need for capacity to repackage waste on-site. *Id*. at 1414:10 to 1416:18.

DOE published an Annual Capacity Report ("ACR") in June 1987 which indicated that DOE's performance would begin with an MRS having been installed and having become operational in 1998 with a total capacity of 15,000 MTU, to be followed by a repository opening in 2003. Tr. 1440:4 to 1442:8 (Test. of Kouts); DX 50 (1987 Annual Capacity Report (June

1987)).[5] If DOE had been able to follow the schedule provided in the 1987 ACR, the repository would have reached its steady-state acceptance rate of 3,000 MTU/year in approximately 2008 (*i.e.*, opening in 2003 with a five-year ramp-up).

Congress adopted the concept of an MRS in enacting legislation in 1987 amending the NWPA. Tr. 1442:4-23 (Test. of Kouts); *see* Nuclear Waste Policy Amendments Act of 1987, Pub. L. No. 100-203, §§ 5001-5065, 101 Stat. 1330, 1330-227 to 1330-255 (1987) (codified in scattered sections of Title 42 of the U.S. Code, including 42 U.S.C. § 10168) . However, Congress placed important limitations on a possible MRS. First, an MRS could not be built until a site was selected and approved for a permanent repository. Tr. 1450:2-22 (Test. of Kouts); *see* 42 U.S.C. § 10168(d)(1). Second, the total capacity of an MRS was to be limited to 10,000 MTU until the permanent repository became operational. *See* 42 U.S.C. § 10168(d)(3). DOE published ACRs for 1991 and 1992 that reflected the operation of an MRS for the first ten years of operational acceptance (beginning in January 1998), with a concomitantly reduced acceptance rate. Tr. 1478:1 to 1484:3 (Test. of Kouts); *see* DX 76 (1991 Annual Capacity Report (Dec. 1991)); DX 84 (1992 Annual Capacity Report Revision 1 (May 1993)). In March 1995, DOE published a combined ACR and Annual Priority Ranking ("APR") for 1994 based on data through 1993 that continued to show an acceptance rate consistent with MRS operations for the first ten years of waste acceptance operations. Tr. 1485:9 to 1490:8 (Test. of Kouts); PX 19 (Acceptance Priority Ranking and Annual Capacity Report (Mar. 1995)).[6]

DOE delayed the issuance of the 1994 APR-ACR until March 1995 because it had become apparent that a repository would not be ready on time. In May 1994, DOE announced that because of the delays in constructing its planned storage repository, it would not begin SNF collection until 2010. Waste Acceptance Issues, 59 Fed. Reg. 27,007, 27,008 (Dep't of Energy May 25, 1994) (notice of inquiry). And, at some point in 1995, DOE determined that it would not be able to site an MRS and abandoned the idea of an MRS. Tr. 1490:9 to 1493:1 (Test. of Kouts). However, DOE did not publish another ACR or APR to reflect these changes until 2004. Tr. 1551:25 to 1554:9 (Test. of Kouts). Notwithstanding its determinations in 1994 and 1995, DOE did not at that time rescind the prior ACRs, nor did it suspend or terminate the obligation of affected utilities to comply with the procedural requirements of the Standard Contract to identify their spent fuel that required disposal.

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[5]As defined in the Standard Contract, ACRs were to "set forth the projected annual receiving capacity for the DOE facility(ies) and the annual acceptance ranking relating to DOE contracts for the disposal of SNF and/or HLW including, to the extent available, capacity information for ten (10) years following the projected commencement of operation of the initial DOE facility." Standard Contract art. IV.B.5(b).

[6]As provided in the Standard Contract, APRs addressed the receipt of SNF and HLW from individual facilities "based on the age of SNF and/or HLW as calculated from the date of discharge of such material." Standard Contract art. IV.B.5(a).

TVA re-racked its storage pool at Sequoyah in 1995, Tr. 768:15 to 769:3 (Test. of Jack A. Bailey, Vice President of Nuclear Asset Recovery and Strategic Projects, TVA), PX 34 at 3 (TVA Report of Costs Incurred by TVA Through September 30, 2002 (July 2003)), and re-racked the pools at Browns Ferry during its fiscal year 1999. Tr. 782:17-25 (Test. of Bailey); Tr. 58:2-6 (Test. of Hayslett).[7] The re-racking increased the aggregate storage capacity of the Sequoyah and Browns Ferry pools to approximately 2,500 MTU, accounting for full core reserve and some unusable cells. Tr. 60:21 to 61:3 (Test. of Hayslett).[8] TVA pursued this re-racking because its estimates in the early 1990's showed that SNF would exceed pool capacity at Sequoyah by the mid-1990's and at Browns Ferry by the year 2000, assuming that DOE's performance had been consistent with the reduced acceptance rates shown in the 1991 ACR. PX 34 at 1. Because the re-racking would have been required even if DOE had performed, TVA does not seek compensation for its re-racking costs. Tr. 58:2 to 59:11 (Test. of Hayslett).

The Standard Contract did not establish a specific rate or schedule for the collection of SNF. Rather, it established a process by which a rate would be established for each utility. *See* Tr. 66:18 to 67:12 (Test. of Hayslett). As previously determined by the court, DOE effectively short-circuited this process by its failure to perform under TVA's Standard Contract. *See Tennessee Valley Auth.*, 60 Fed. Cl. at 674. That action by DOE breached the scheduling provisions of TVA's Contract at some point during 1997. *Id.*[9]

Under the contractual process, TVA was to submit to DOE proposed Delivery Commitment Schedules ("DCSs") for DOE's review and approval. JX 1 at 11, App. C. Such DCSs were to specify the amount of SNF the utility "wishe[d] to deliver to DOE beginning sixty-three (63) months thereafter." *Id*. at 11. The amount of spent fuel covered by such DCSs was to be based upon allocations established by DOE and published in ACRs and APRs. ACRs were to set forth the projected annual receiving capacity for DOE facilities for ten years following the projected commencement of operation of the initial DOE facility. *Id.* at 10; Tr. 67:1-12 (Test. of Hayslett). APRs were to provide utilities with annual allocations of available capacity, based on a doctrine calling for the utilities with the oldest fuel to receive the earliest allocations. JX 1 at 10; Tr. 910:1-19 (Test. of Pollog).

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[7]Re-racking is a process whereby existing SNF racks in a wet storage pool are removed and replaced with higher density racks, which provide additional capacity for fuel assemblies. This has the effect of increasing the storage capacity of the pool.

[8]Commercial nuclear power producers typically maintain a "full core reserve" at each nuclear generation facility, which means that utilities leave enough spaces in the wet storage pools at each facility to unload fully the fuel from one reactor in case of an exigent circumstance. *See Tennessee Valley Auth.*, 60 Fed. Cl. at 675 n.11.

[9]Utilities may well have had a basis to undertake measures as early as May 1994 to mitigate a future breach. DOE had announced in May 1994 that it would not be in a position to accept SNF for disposal until 2010. *See supra*, at 5.

TVA based its estimates of DOE's SNF collection on the APR–ACR issued in March 1995. Tr. 84:10-23 (Test. of Hayslett). This APR-ACR indicated that TVA's first allocation of capacity would occur in 2002. *Id*. at 84:13-16; *see* PX 19. Thus, under the terms of the contract, TVA was required to submit a DCS to DOE 63 months prior to the date listed in the ACR to lock in that capacity allocation. Tr. 83:23-24 (Test. of Hayslett); JX 1 at 11. In consequence, TVA was required to submit its first DCS in 1997. TVA's DCS submittals for 2002-2007 were filed with DOE beginning in 1997. Tr. 9:20 to 10:19. These DCSs represented TVA's allocations for the first 10 years. DOE was required by contract to approve or disapprove the schedules within three months. JX 1 at 11. However, TVA's DCSs were neither approved nor disapproved. Tr. 84:24 to 85:5 (Test. of Hayslett).

In response to DOE's failure to act on TVA's DCSs beginning in 1997, in addition to other indications that DOE would not begin performing in 1998 (including the May 1994 notice, Waste Acceptance Issues, 59 Fed. Reg. at 27,008, and a TSLCC issued in September 1995, PX 20 (TSLCC (Sept. 1995)), TVA created a spent nuclear fuels task force in the 1996 and 1997. Tr. 999:10 to 1000:2 (Test. of Donald L. Hutson, former senior project manager in TVA's nuclear fuels division). TVA came to the conclusion that because DOE would not begin collection of its waste in 2002, its storage-pool capacity minus one full-core reserve at Sequoyah would be exceeded in 2004, the capacity of the storage pool serving Browns Ferry Unit 3 would be fully used by 2006, and the storage pool serving Browns Ferry units 1 & 2 would reach its normal full usage in 2010. DX 311 (TVA Analysis of Storage Pool Capacity, Prepared by George M. Holton, Jr., senior engineering specialist in TVA's nuclear fuel supply and disposal department).[10] TVA considered a number of potential strategies for dealing with the spent fuel that exceeded the normal capacity of its pools, *see* Tr. 783:10 to 797:3 (Test. of Bailey), and ultimately decided to build dry storage facilities at both Sequoyah and Browns Ferry. TVA began planning for the dry storage facility at Sequoyah in 1998, construction began in 2001, and installation was completed in Fiscal Year 2004. PX 34 at 5; PX 43 (TVA Report of FY 2004 Costs Incurred by TVA (Nov. 2004)), at 1.[11] TVA commenced storing SNF at its Sequoyah dry storage facility during FY 2004. PX 43 at 5. TVA also began planning for construction of a dry storage facility at Browns Ferry in 1998; construction on the project began in 2001. PX 34 at 16, 18-20. As of September 30, 2004, the storage pad for the dry storage facility at Browns Ferry was 75% complete, and TVA envisioned that it would begin loading spent fuel into casks for storage in that dry storage facility during the summer of 2005. PX 43 at 6, 8.

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[10]TVA recently decided to restart Browns Ferry Unit 1, which had been idled. TVA expects that Unit 1 will be reloaded in 2006 and restarted in 2007. Tr. 1248:10-22 (Test. of Holton).

[11]TVA's Fiscal Year ("FY") ends on September 30 of each year; *e.g.*, FY 2004 ended September 30, 2004.

DISCUSSION

Standards for Decision

It is a basic tenet of contract law that "'[t]he remedy for breach of contract is damages sufficient to place the injured party in as good a position as it would have been had the breaching party fully performed.'" *Indiana Mich. Power Co. v. United States*, 422 F.3d 1369, 1373 (Fed. Cir. 2005)(citing *San Carlos Irrigation & Drainage Dist. v. United States*, 111 F.3d 1557, 1562 (Fed. Cir. 1997)). "'[T]he general principle is that all losses, however described, are recoverable.'" *Indiana Mich.*, 422 F.3d at 1373 (quoting *Restatement (Second) of Contracts* § 347 cmt. c).

TVA's claim is fundamentally one to recover costs incurred in its efforts to mitigate damages resulting from DOE's breach. Where a party to a contract is put on notice by the other contracting party that it does not intend to perform under the contract, the non-breaching party has an obligation to take steps to avoid damage. "'[O]nce a party has reason to know that performance by the other party will not be forthcoming, . . . he is expected to take such affirmative steps as are appropriate in the circumstances to avoid loss by making substitute arrangements or otherwise.'" *Indiana Mich.*, 422 F.3d at 1375 (quoting *Restatement (Second) of Contracts* § 350 cmt. b); *see also Tennessee Valley Auth.*, 60 Fed. Cl. at 674 (same).

In its earlier decision, this court noted that TVA's claim is necessarily one for partial breach; to find a "total breach would abort the contract, thereby obviating DOE's obligation to collect TVA's SNF . . . in the future and most likely resulting in the forfeiture of TVA's operating licenses [for its nuclear plants] pursuant to 42 U.S.C. § 10222(b)." *Tennessee Valley Auth.*, 60 Fed. Cl. at 677-78; *see also Indiana Mich.*, 422 F.3d at 1374. The Federal Circuit held in *Indiana Michigan* that there is "no reason why efforts to avoid damages in contemplation of a partial breach should not . . . be recoverable," just as they are recoverable for mitigation upon a total breach. 422 F.3d at 1375. Accordingly, TVA is not barred from recovery because its claim is one for recoupment of its costs of mitigation due to partial breach.

To recover damages, TVA must show that "(1) the damages were reasonably foreseeable by the breaching party at the time of contracting; (2) the breach is a substantial causal factor in the damages; and (3) the damages are shown with reasonable certainty." *Indiana Mich.*, 422 F.3d at 1373 (citing *Energy Capital Corp. v. United States*, 302 F.3d 1314, 1320 (Fed. Cir. 2002)). *See also Indiana Mich.*, 422 F.3d at 1376 ("[plaintiff] must prove foreseeability, causation, and reasonableness").

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. *See Restatement (Second) of Contracts* § 350(2); *First Heights Bank, FSB v. United States*, 422 F.3d 1311, 1316-17 (Fed. Cir. 2005); *Long Island Savs. Bank, FSB v. United States*, 67 Fed. Cl. 616, 642 (2005);

see also Koppers Co. v. Aetna Cas. and Sur. Co., 98 F.3d 1440, 1448 (3d Cir. 1996) (applying Pennsylvania law) ("Mitigation is an affirmative defense, so the burden of proving a failure to mitigate is on the defendant.") (citing *Williams v. Masters, Mates and Pilots of Am.*, 120 A.2d 896, 901 (Pa. 1956); *Ecksel v. Orleans Constr. Co.*, 519 A.2d 1021, 1028 (Pa. Super. Ct. 1987)). In short, TVA's damages may be reduced to the extent that the government can show TVA did not undertake reasonable efforts to mitigate its damages or that the efforts it did undertake were insufficient or unreasonable. "The amount of loss that [the non-breaching party] could reasonably have avoided by . . . making substitute arrangements or otherwise is simply subtracted from the amount that would otherwise have been recoverable as damages." *Restatement (Second) of Contracts* § 350 cmt. b. Nonetheless, TVA is "'not precluded from recovery . . . to the extent that [it] has made *reasonable* but unsuccessful efforts to avoid loss.'" *Indiana Mich.*, 422 F.3d at 1375 (quoting *Restatement (Second) of Contracts* § 350(2)) (emphasis added).

Analysis

A. The Time Period Covered by TVA's Claim

In its decision in *Indiana Michigan*, a SNF case also involving a Standard Contract with DOE, the Federal Circuit determined that "[b]ecause [the utility's] claim is premised upon the government's partial breach, its damages were limited to those costs incurred prior to the date of its suit." 422 F.3d at 1376-77. In preparation for the trial on damages in this case, which took place in June and July of 2005, the court requested that the parties cover at trial TVA's damages through its most recently completed Fiscal Year, *i.e.*, through September 30, 2004. *See Tennessee Valley Auth.*, 60 Fed. Cl. at 679. The parties' supplemental filings and proofs of damages put forward at the trial therefore were calibrated to show events through September 30, 2004. Accordingly, under RCFC 15(a), (b), and (d), the court determines that TVA has sought and pursued an amended and supplemental complaint alleging damages through that date. *See Intrepid v. Pollock*, 907 F.2d 1125, 1129 (Fed. Cir. 1990) (citing *Griffin v. School Bd.*, 377 U.S. 218, 227 (1964)); *Remediation Constructors, Inc. v. United States*, 68 Fed. Cl. 162, 167 (2005) (supplemental complaint); *United Partition Sys., Inc. v. United States*, 59 Fed. Cl. 627, 644 (2004) (same) (citing Fed. R. Civ. P. 15(d) advisory committee's note to the 1963 amendment; *Mathews v. Diaz*, 426 U.S. 67, 75 (1976); *Black v. Secretary of Health and Human Servs.*, 93 F.3d 781, 790 (Fed. Cir. 1996)). In accord with RCFC 15, the court grants amendment and supplementation of TVA's complaint to pursue damages through September 30, 2004.

B. TVA's Claimed Damages

TVA's dry storage facilities, also known as independent spent fuel storage installations ("ISFSI"), were constructed to accommodate storage casks containing shielded spent nuclear fuel on secure concrete pads. The storage casks themselves are constructed of steel and concrete and are approximately 10 feet in diameter and 20 feet in height. They may weigh 270 tons each when filled with spent nuclear fuel assemblies. Tr. 321:15-17, 325:5 to 326:5 (Test. of Charles R. Davis, Project Manager at TVA's Sequoyah Nuclear Plant). The process of putting SNF into dry

storage begins at a spent fuel pool. The fuel to be placed into dry storage must have been in a pool for five years or longer, because spent fuel removed from a reactor pool more quickly would be too "hot" to store safely in a dry storage cask. JX 1 (Standard Contract) App. E, ¶ 3; Tr. 2293:25 to 2294:6 (Test. of Dr. Raymond S. Hartman). A container called a multi-purpose canister ("MPC") is lowered into the pool, and spent fuel assemblies are loaded. The MPC will serve as the innermost container for the spent fuel within a storage cask. The MPC is moved to a refueling area, where it is welded shut, taken out of the water, and placed into a container called a "transfer cask." The transfer cask is taken to a railroad bay, where the transfer cask is lifted by crane onto a storage cask made of steel and concrete. The MPC is then transferred directly from the transfer cask into the storage cask, after which a concrete lid is placed on the storage cask. The filled storage cask is then moved a short distance by rail out of the railroad bay, then loaded onto a large "crawler" type vehicle that carries the cask to the dry storage pad. Tr. 317:14 to 324:6, 1034:1 to 1038:25 (Test. of Davis).

Building the dry storage facilities required numerous alterations to TVA's plant sites. In addition to building concrete storage pads, TVA had to modify its facilities to enable loading of spent fuel assemblies into the casks and subsequent transporting of the casks to the storage-pad area. The roads and railroad bays at the plant sites were not originally designed to carry loads as heavy as the storage casks. These roads and railroad bays were rebuilt, and some underground utilities had to be moved. Alterations had to be made to the storage pools to accommodate the MPCs, and new fail-safe cranes had to be installed in the loading area. Tr. 319:15 to 326:14 (Test. of Davis).[12] Additionally, at Browns Ferry an additional turning pad had to be installed to accommodate the crawler, and security facilities had to be altered and extended significantly at Browns Ferry because at that nuclear plant, unlike at Sequoyah, the dry storage facility could not be accommodated within the secure area previously available. Tr. 588:13 to 590:12 (Test. of Robert A. Chapman, Project Manager at TVA's Browns Ferry Nuclear Plant).

Early in its preparations for the dry storage construction projects, TVA requested proposals from a number of different possible suppliers of storage casks. TVA ultimately selected Holtec International ("Holtec") to design the ISFSI and to provide the storage casks. Tr. 317:2-4 (Test. of Davis). TVA determined that Holtec provided the best design in terms of ease of use and safety, and that Holtec's design would be cost-effective over the long term. Tr. 315:20 to 317:13 (Test of Davis); PX 34 at 3. TVA contracted with the engineering firm Stone & Webster to conduct much of the construction and field engineering work on the projects. Tr. 326:15 to 328:4 (Test. of Davis), 590:17-25 (Test. of Chapman). TVA also employed internal resources on the projects, including TVA-owned heavy equipment and TVA's central engineering staff. Tr. 328:19 to 330:15 (Test. of Davis).

[12]TVA has determined that it would have had to upgrade the cranes had DOE performed on its contract; therefore TVA does not seek damages for that expense. Tr. 337:4 to 338:1 (Test. of Davis).

TVA has used a "but for" methodology in determining whether costs associated with the dry storage projects at Sequoyah and Browns Ferry are recoverable. A cost recovery has not been sought if a cost would have been incurred in connection with DOE's performance under the TVA Contract. Tr. 336:6 to 337:3 (Test of Davis), 617:25 to 620:6 (Test. of Chapman); PX 34 at 7. TVA has identified the following major items to be non-recoverable: a study conducted to test the survivability of the crane in the auxiliary building; modifications to the auxiliary building crane; and construction of the cask work platform, support stand, loading area stand, and lifting yoke. PX 34 at 7. TVA has also determined that 50% of the costs associated with training, operating, and maintenance procedures should not be allocated to DOE, because some of these costs would have been incurred in the non-breach, but-for world associated with DOE's performance. *Id*.

TVA has allocated those costs it deems recoverable into five different categories: (1) TVA labor; (2) contract services and procurement; (3) internal charge-backs; (4) overhead; and (5) travel. *See* PX 34 at 8. The TVA-labor category encompasses the direct salaries paid to TVA's employees for work performed in connection with the dry storage project. Contract-services expenses are those associated with personal-service contracts and other arrangements for obtaining professional services (*e.g.*, engineering services or staff augmentation). Procurement relates to purchases of tangible items such as equipment, fittings for facilities, and materials for construction. Internal charge-back expenses consist primarily of costs associated with engineering work performed by the TVA nuclear corporate engineering group, and also includes equipment rental from TVA's internal heavy-equipment division. Overheads include various TVA-attributed costs, including workman's compensation, insurance, allowance for funds used during construction ("AFUDC"), and indirect administrative charges. Travel expenses include costs incurred by TVA employees traveling in connection with the project; travel related to the dry storage projects was conducted and charged in accordance with federal travel regulations. *See id*. at 8-16.

TVA requests that the court award damages incurred in constructing and operating SNF dry storage facilities at TVA's Sequoyah and Browns Ferry Nuclear Plants which, except for DOE's breach, would have been unnecessary. Tr. 176:4-7 (Test. of Hayslett), 336:6 to 337:3 (Test of Davis), 619:14 to 620:6 (Test. of Chapman). In its pretrial submissions, TVA claimed mitigation damages totaling $35,752,512.11 through September 30, 2004, which amount includes the capital costs of the dry storage facilities at Sequoyah and Browns Ferry incurred through September 30, 2004, as well as the costs of operations and management (O/M) at the Sequoyah dry storage facilities in FY 2004. TVA's evidence of damages is summarized as follows:

Sequoyah Nuclear

FY	TVA Labor	Contract Servs. & Procurement	Internal Charge-backs	Overhead	Travel	FY Totals
1998	$8,345.59	$0.00	$0.00	$703.70	$95.96	$9,145.25
1999	33,026.08	125,952.40	191,892.22	37,198.71	1,859.43	389,928.84
2000	62,133.92	185,744.16	87,920.03	34,066.43	3,037.02	372,901.56
2001	161,542.27	1,519,715.93	14,121.52	99,739.24	838.14	1,795,957.10
2002	98,926.01	3,431,039.35	231,183.06	267,435.66	652.72	4,029,236.80
2003	201,131.25	7,300,563.51	420,322.08	736,684.12	1,319.45	8,660,020.41
2004 Cap.	266,475.06	3,630,852.12	243,922.47	575,000.05	2,186.12	4,718,435.82
2004 O/M	7,773.20	143,395.30	4,588.00	6,790.00	12.00	162,558.50
Total	$839,353.38	$16,337,262.77	$1,193,949.38	$1,757,617.91	$10,000.84	$20,138,184.28

Browns Ferry Nuclear

FY	TVA Labor	Contract Servs. & Procurement	Internal Charge-backs	Overhead	Travel	FY Total
1999	$0.00	$ 180,000.00	$ 0.00	$ 0.00	$ 0.00	$180,000.00
2000	5,784.62	120,000.00	0.00	0.00	411.45	126,196.07
2001	124,393.82	84,454.28	7,125.00	83,164.87	7,671.75	306,809.72
2002	58,377.94	3,134,023.55	3,952.00	84,110.03	6,078.44	3,286,541.96
2003	115,178.47	4,963,420.76	108,070.73	246,275.21	1,283.93	5,434,229.10
2004	258,195.21	3,813,485.77	1,662,653.23	519,236.05	26,980.72	6,280,550.98
Total	$561,930.06	$12,295,384.36	$1,781,800.96	$ 932,786.16	$42,426.29	$15,614,327.83

PX 72 (Summary of TVA's Incurred Costs - SQN); PX 73 (Summary of TVA's Incurred Costs – BFN); *see* Tr. 499:7-20 (Test. of Paul J. Walker, Project Control Specialist at TVA's Sequoyah Nuclear Power Plant), 608:11-25 (Test. of Chapman).

Of these claimed costs, Mr. Walker of TVA testified at trial that the total amount for Sequoyah should be reduced by $21,074, due to an inadvertent accounting error that included

repair costs for the crane that were not recoverable. Tr. 501:20 to 502:23 (Test. of Walker). Mr. Chapman, project manager at Browns Ferry Nuclear, testified that the amount of damages for Browns Ferry of $15,614,327.83 should be reduced by $48,000, to eliminate an amount that was paid to Holtec for a study that was not part of the dry storage project. Tr. 628:9 to 629:1 (Test. of Chapman). These two deductions reduce the total damages claimed in TVA's submittals to $35,683,438.11.

1. *Causation.*

To prevail, TVA must show that it built the dry storage facilities to respond to DOE's breach. *See Indiana Mich.*, 422 F.3d at 1373. Both parties start from the premise that (1) DOE's allotted quantities for disposal during the ten-year period from 1998–2007 would apply,[13] (2) DOE's first pick-up under that ten-year schedule would have occurred in 2002, and (3) if DOE had performed under that schedule, then given the capacity of TVA's SNF pools and the estimated rate of TVA's SNF generation, TVA's pools would have been sufficient to handle its SNF for the first ten years of DOE's performance (1998–2007) under the contract without building dry storage facilities.[14]

The government nonetheless contests causation of damages, suggesting that TVA made plans to build dry storage prior to DOE's breach, and therefore DOE's breach was not the but-for cause of TVA's decision to build dry storage. Internal TVA documents indicate that TVA conceptually investigated the possibility of using dry storage prior to 1997. *See, e.g.,* DX 41 (*Concept for an All-Purpose Transport, Storage, and Disposal Cask for Spent Nuclear Fuel Management*, Raymond E. Hoskins, TVA (Dec. 12-15, 1983)); DX 92 (*TVA High Level Waste Situation* (Dec. 5, 1996)). However, the same early documents reveal that these investigations were inchoate and speculative in nature. *See* DX 92 ("A limited quantity of on-site dry cask storage *may* be needed.") (emphasis added). As of 1997, TVA had made no decision to build dry

[13]TVA accepted for purposes of this litigation the quantities of SNF allotted by DOE for disposal during the ten-year period from 1998-2007 when DOE expected to be using an MRS that was never built. *See Tennessee Valley Auth.*, 60 Fed. Cl. at 671. That concession appears to be unique among the numerous spent-fuel plaintiffs pursuing claims in this court. Because DOE has not to date picked up any SNF from TVA or any other holder of a Standard Contract, DOE has breached its contract with TVA. *Id*. at 674.

[14]The government disputes that TVA's pools would *always* have been sufficient to accommodate accumulating SNF if DOE had begun to perform in 1998. *See* Closing Arg. Tr. 68:19-23 (Oct. 27, 2005) (government's counsel's statement that TVA would have needed to begin dry storage in 2013 if DOE had performed as DOE had projected and TVA expected); DX 217 (Report of Dr. Raymond S. Hartman) at EXT013 0035, EXT013 0036 (opining that TVA would have needed to begin dry storage at Sequoyah and Watts Bar in approximately 2013 if DOE had picked up SNF at a total rate of 900 MTU/year from 1998 onwards). This contention is addressed *infra*, at 17-21.

storage, nor had it undertaken any detailed examination of that possibility. Tr. 767:15-22 (Test. of Bailey).

TVA initiated a number of operational changes in its nuclear program in the mid-1990's. These changes included license extensions for its current facilities, power upgrades in each of its facilities, the restart of the Browns Ferry 1 reactor, and participation in tritium and "BLEU" fuel programs with DOE.[15] Each of these changes resulted in an increased amount of SNF output by TVA's nuclear facilities. Tr. 70:8 to 71:18 (Test. of Hayslett). These changes, however, would not have caused TVA to exceed its pool storage capacity during the first ten years of DOE SNF collection if DOE had performed under the contract. *Id*. at 71:19 to 73:6.

The court finds that but for DOE's failure to perform under the Contract, TVA would not have been required to build dry storage facilities, and that TVA's decision to build dry storage was made in direct response to DOE's breach. *See* DX 105 (TVA Spent Fuel Storage Study (Dec. 12, 1997)), at TVA003742 ("DOE has informed utilities that disposal of spent fuel at a federal repository will not begin in 1998. . . . Consequently, it is imperative that TVA[ ] implement spent fuel storage alternatives.").

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[15]The government has suggested that TVA's participation in DOE's programs for production of tritium and for use of blended low enriched uranium ("BLEU") fuel is partially responsible for TVA's need for dry storage. *See, e.g.*, Tr. 181:3 to 183:7 (Test. of Hayslett). As discussed *infra*, at 17, TVA's investigation of its possible participation in these programs affected its plans for the pools. The tritium program prevented TVA from using its cask pit at Sequoyah for interim SNF storage; the cask pit is needed as part of the tritium program for loading and unloading. Additionally, the process of tritium production requires that some additional uranium be used in the reactor, thereby creating some additional SNF. Tr. 201:9 to 202:12 (Test. of Hayslett). TVA did not agree to participate in the tritium program until approximately 1999, however (after DOE's breach), *see infra*, at 17, and DOE is contractually responsible for the additional spent fuel costs associated with the tritium program. Tr. 202:13-20 (Test. of Hayslett). The tritium program, therefore, was not a causal factor in TVA's decision to build dry storage. TVA's participation in DOE's BLEU fuel program is reflected in an agreement by which TVA has agreed to accept fuel from DOE for use at Browns Ferry that contains higher levels of impurities than are found in normal commercial-grade nuclear fuel. BLEU fuel is derived from reprocessed material. The result of using this fuel is a slight increase in SNF production. *Id*. at 70:8 to 71:5, 76:4 to 79:2. However, like the tritium program, the BLEU fuel program did not originate until after DOE's breach, and the first shipment of BLEU fuel was not loaded at Browns Ferry until Spring of 2005. *Id*. at 76:4-12. Therefore, like the tritium program, the BLEU fuel program did not affect TVA's immediate need for dry storage. Moreover, both programs were undertaken by TVA at the behest of DOE.

2. *Foreseeability.*

For TVA to recover, the damages must have been reasonably foreseeable by the breaching party at the time of contracting. *Indiana Mich.*, 422 F.3d at 1373 (citing *Energy Capital*, 302 F.3d at 1320; *see also Restatement (Second) of Contracts* § 351(1) ("Damages are not recoverable for loss that the party in breach did not have reason to foresee as a probable result of the breach when the contract was made."). The *Restatement* defines foreseeability as follows: "(2) Loss may be foreseeable as a probable result of a breach because it follows from the breach (a) in the ordinary course of events, or (b) as a result of special circumstances, beyond the ordinary course of events, that the party in breach had reason to know." *Id*. DOE was aware of the nation's growing spent nuclear fuel inventory at the time it entered into the TVA Contract. DOE designed its waste disposal plan to collect all new SNF created by the nations's nuclear utilities, as well as to reduce and eventually eliminate the backlog of SNF that utilities had generated to date. *See supra*, at 3. DOE also recognized that utilities might be forced to build additional on-site storage facilities if DOE were not successful in performing under its contracts for SNF disposal, as reflected by the fact that one of DOE's goals was to preclude the utilities' need to provide storage outside their spent fuel pools. *See supra*, at 3. In short, the court finds that it was entirely foreseeable to DOE that failure to perform under the contract would result in damages of the nature and magnitude that TVA claims.

3. *Certainty.*

To recover, TVA must prove its damages with reasonable certainty. *Indiana Mich.*, 422 F.3d at 1373 (citing *Energy Capital*, 302 F.3d at 1320 (Fed. Cir. 2002)). "While the amount of damages need not be 'ascertainable with absolute exactness or mathematical precision[,]' recovery for speculative damages is precluded." *Indiana Mich.*, 422 F.3d at 1373 (quoting *San Carlos Irrigation*, 111 F.3d at 1563); *see also Restatement (Second) of Contracts* § 352. The Federal Circuit dealt with the certainty issue in *Indiana Michigan* by specifying that a utility bringing suit under the Standard Contract would be limited to recovering damages that it had actually incurred. *Indiana Mich.*, 422 F.3d at 1376-77. Projected future damages were not currently obtainable, but new claims for damages could be brought later after additional actual expenditures had been incurred. *Id*. As previously noted, *supra*, at 9, this court's prior decision had also limited TVA to its actual damages through the most recently completed fiscal year antedating trial, *see Tennessee Valley Auth.*, 60 Fed. Cl. at 679, and the parties' supplemental filings and proofs put forward at the trial have been calibrated to address actual damages and events through September 30, 2004. Accordingly, TVA's damages can be calculated with reasonable certainty.

C. Reasonableness of TVA's Mitigation

There is no dispute that TVA acted to mitigate the damages caused by DOE's partial breach. TVA accordingly fulfilled its obligations to take affirmative steps to avoid loss. *See Indiana Mich.*, 422 F.3d at 1375 (citing *Restatement (Second) of Contracts* § 350(2)). TVA's

expenses of its mitigation are accordingly recoverable to the extent they are reasonable. In that regard, as noted *supra*, at 8-9, the government bears the burden of proving that TVA's actions to mitigate DOE's partial breach were unreasonable.[16]

1. *TVA's chosen method of mitigation.*

TVA's mitigating actions were successful and thus presumptively reasonable. It nonetheless had explored mitigating strategies other than dry storage, but it rejected them as more expensive or impracticable.[17] TVA examined a number of ways in which it might reconfigure its existing pools. Re-racking the pools at Sequoyah and Browns Ferry was not a viable alternative. As described *supra*, at 6, Sequoyah and Browns Ferry had already been re-racked or were in the process of re-racking when DOE's breach occurred. Once re-racking of a SNF storage pool has taken place with high-density racks, the capacity of that pool has essentially been fully used, and further re-racking would provide nominal gains. Tr. 768:15 to 769:3 (Test. of Bailey). TVA also looked at the possibility of using "baby racks"; *i.e.*, racks that fit around the outside edges of the pools. Technical reviews of this option, however, indicated that it would have been technically marginal from a regulatory and safety perspective. *Id*. at 783:10 to 785:23, 787:2. TVA additionally investigated a method of storage known as "cask-pit storage," but decided against this option because it would have been costly and would have reduced the operational flexibility of the plant. *Id*. at 770:18-22. Cask-pit storage would have involved placing storage racks in the cask pit, the area of the pool used for loading and unloading

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[16]That mitigation is chiefly at issue cannot be contested. As the Federal Circuit determined in *Indiana Michigan*:

> [Upon discovering DOE's breach], utilities were in fact obligated to take mitigatory steps. It would have been improvident for [utilities] to have waited until January 1998 before deciding what to do with [their] nuclear waste. Indeed, the losses which the utilities are obligated to mitigate are not merely pecuniary unto themselves, *e.g.*, the increased cost of obtaining storage for SNF on short notice. Having been placed in a position where they are required to find alternate storage for SNF, the utilities must *de facto* accept responsibility to guard against the environmental impact of improperly-disposed and maintained SNF, a situation which the NWPA was enacted to avoid.

422 F.3d at 1375.

[17]A non-breaching party need only pursue reasonable mitigation alternatives, and is not required "to take steps to avoid loss if those steps may cause other serious loss. [The non-breaching party] need not, for example, make other risky contracts, incur unreasonable expense or inconvenience or disrupt [its] business." *Restatement (Second) of Contracts* § 350 cmt. g.

fuel casks. *Id*. at 769:4 to 770:17. An additional limitation on the use of cask-pit storage was that after the breach, TVA contracted with DOE to produce tritium. The tritium program required that the cask pits at Sequoyah and Watts Bar be available for loading and unloading tritium casks from DOE, and that need eliminated the possibility of using the cask pits for storage. *Id*. at 771:8 to 774:15.

In addition to considering methods of reconfiguring existing pools, TVA evaluated the possibility of transshipment of SNF and private fuel storage. TVA particularly evaluated transshipment of spent fuel from Sequoyah to Watts Bar, a nuclear generation facility with more available pool capacity than at Sequoyah. Transshipment was considered technically possible (both reactors use the same technology and have compatibly sized fuel assemblies), but the costs and public-relations hurdles were considered too high to make this option practicable at the time. Tr. 792:12 to 794:14 (Test. of Bailey); *see also* DX 120 (Spent Fuel Storage Evaluation (July 29, 1998)) (TVA's Chief Nuclear Officer directed TVA to "[d]iscontinue any further consideration of the transshipment option."), at 7. TVA also did not have the option of resorting to "private" fuel storage facilities. None have been licensed. Tr. 796:21 to 797:3 (Test. of Bailey). Moreover, TVA is not a member of any private fuel storage consortium. *Id*. at 796:10-17.

The court concludes that TVA was reasonable in its chosen method of mitigation.

2. *The government's claim that TVA's damages should be limited because dry storage would have been necessary at some future point even absent a breach.*

The government avers that TVA would have been required to build dry storage facilities at Sequoyah and Browns Ferry even if DOE had not breached its contract with TVA. The effect of DOE's breach, the government argues, was merely to require TVA to build the dry storage facilities sooner than they would have but for the breach. Tr. 38:10-21 (Def.'s opening statement); Def.'s Initial Post-Trial Br. at 9-10, 18-32. The government frames this argument as one of causation, *see* Tr. 38:21-22 (Def.'s opening statement), but in the circumstances of this case, it realistically is a contention aimed at limiting the amount of damages TVA may recover as a result of its mitigation efforts. The government contends that TVA's damages should be constrained to the difference between the costs of building the dry storage facilities in the present (breach) world versus the costs of building the facilities later in the but-for, non-breach world. *See* Tr. 2356:8 to 2362:3 (Test. of Hartman); Def.'s Initial Post-Trial Br. at 32-33. Because the government seeks to limit the non-breaching party's recovery for mitigation, the government bears the burden of proof. *See supra*, at 8-9.

The first ten years of DOE's expected performance are not in dispute. Both parties accept the aggregate rates of SNF acceptance that DOE provided for the first ten years of DOE SNF acceptance in the ACR for 1994 as issued in March 1995. DX 311; *see supra*, at 13 n.13; *see also* PX 19 at 4. Under the 1994 ACR, DOE was to collect an aggregate of 400 MTU in year one, 600 MTU in year two, and 900 MTU in years three to ten. PX 19 at 4. Notably, a part of the seventh year, 2004, and all of the eighth, ninth, and tenth years, 2005-2007, are beyond the

scope of the actual damages at issue in this litigation. Thus, the government's contention addresses future events, and it must shoulder the double burden of establishing that the future events were relatively certain to occur and that TVA's mitigation was unreasonable in light of those events.

A key dispute between the parties respecting those future events concerns the rate of acceptance that DOE might have established in the but-for, non-breach world for the years after year ten, *i.e.*, year eleven (2008) and onward. This is largely a hypothetical exercise.

At trial, TVA presented evidence indicating that TVA projected its expected allocations for year eleven (*i.e.*, 2008) onward on the assumption that DOE'S acceptance of SNF would reach a rate of 3,000 MTU/year beginning in year eleven. Tr. 73:8 to 75:13, 88:12 to 89:9 (Test. of Hayslett). The 1994 ACR (issued in 1995) did not provide aggregate SNF acceptance rates for the time period after year ten (2007), *see* PX 19 at 4, and the 1994 ACR itself has been overtaken by events. The government endeavors to support two propositions: first, that 3,000 MTU/year is not an appropriate long-term steady-state disposal rate, *see* Def.'s Initial Post-Trial Br. at 9-10, and second, that DOE in the but-for world would not have reached the 3,000 MTU/year steady-state rate until approximately 2015, not 2008. Def.'s Initial Post-Trial Br. at 12; Tr. 1461:1 to 1462:11 (Test. of Kouts).

The government's first contention does not comport with the long-term acceptance rates listed in nearly all of DOE's planning documents. As discussed *supra*, at 4, DOE's planning documents consistently referenced a 3,000 MTU/year long-term steady-state rate.

The government rests its second contention on a DOE document released in December 1990 entitled *Preliminary Estimates of the Total-System Cost for the Restructured Program* ("PETSC"), DX 292. Tr. 162:9 to 169:6 (Test. of Hayslett); *see* Tr. 37:17 to 40:22 (Def.'s opening statement). The government argues that TVA should be bound by the rates listed in the PETSC because one of TVA's October 2001 interrogatory responses stated that the PETSC was one of many documents on which TVA relied to help it determine DOE's future rates of acceptance. Def.'s Initial Post-Trial Br. at 16-17; *see* DX 176 (TVA's Answers to Defendant's First Set of Interrogatories (Oct. 9, 2001)) at 9a. The primary purpose of the PETSC was to evaluate the costs of the program and the adequacy of the fees being paid into the program. DX 292 at (iii.). In calculating the costs of the program, the PETSC listed as one of its assumptions that the first repository would be delayed until 2010. *Id*. at 3, 9, 25. This represented a change from earlier DOE documents, which had stated that repository operations would begin in 2003. *See id*. at 3; DX 51 (*Office of Civilian Radioactive Waste Management Mission Plan Amendment* (June 1987)), at 6, 10. Given that the ramp-up period for the repository would be approximately five years, *see* Tr. 852:6 to 857:19 (Test. of Barrett), if the repository opened in 2010, it would not reach its steady-state rate until approximately 2015. The 1990 PETSC shows an acceptance rate of 400 MTU in 1998 and 1999, 900 MTU/year from 2000 to 2009, 1,800 MTU/year from 2010 to 2014, and 3,000 MTU/year from 2015 onwards. DX 292 at A1. The government argues

that the rates of acceptance listed in the 1990 PETSC represent the rates of acceptance that would have prevailed in the non-breach, but-for world. Def.'s Initial Post-Trial Br. at 15-17.

An examination of the 1990 PETSC, however, demonstrates that its rates of acceptance are based upon a mistaken assumption: that "Congress . . . [would] modify the current linkages between the repository and the MRS facility in order to allow the MRS facility to begin accepting waste in 1998." DX 292 at 10. As previously observed, Congress imposed a number of restrictions when it authorized an MRS in the Nuclear Waste Policy Amendments Act of 1987. One of these restrictions was that construction of an MRS could not begin until after issuance of a license for the construction of a repository. Congress never eliminated this "linkage." *See* 42 U.S.C. § 10168(d)(1)). Therefore, the acceptance schedule envisioned by the 1990 PETSC was based on assumptions that were never authorized by Congress, and the linkage referred to in the PETSC was still in effect when DOE released the 1994 ACR in March 1995. Because the 1994 ACR listed 1998 as the first year of DOE SNF acceptance, the assumption implicit in 42 U.S.C. § 10168(d)(1) is that the permanent repository would have been sited by that time. With the repository sited by 1998, and construction requiring approximately five years, the repository should have opened in approximately 2003. With a five-year ramp-up required to reach a steady state rate, the acceptance rates listed in the 1994 ACR indicate that it would have been reasonable to assume that DOE would begin accepting 3,000 MTU/year by 2008. This ten-year schedule, with construction of a repository beginning in 1998 with repository acceptance reaching 3,000 MTU/year in 2008, is consistent with the *Mission Plan Amendments* issued by DOE in 1987. DX 51 at 41-42, 61.

For purposes of this litigation, TVA has chosen to ignore any additional capacity that a permanent repository may have provided during the 2003-2008 time period (the "ramp-up" period), and it does not contest TVA's allocations as published by DOE in its 2004 APR for the years 1998-2007. Tr. 1213:21 to 1215:11 (Test. of Holton); DX 311. TVA claims that if DOE had begun performance in January 1998 as provided in the Contract, with TVA's first allotment scheduled for year five of operations (2002), and if DOE had collected SNF at a rate of 3,000 MTU/year beginning with year 11 (the "TVA 3,000" rate), then TVA would have had sufficient pool capacity to avoid building dry storage. Tr. 71:25 to 73:6 (Test. of Hayslett). TVA further contends that even if the court accepts the rates assumed in the 1990 PETSC as the government advocates (the "DOE 3,000" rate), TVA still would have been able to avoid building dry storage by employing a number of different options at its disposal to bridge a small temporary gap. Pl.'s Response to Def.'s Initial Post-Trial Brief ("Pl.'s Initial Post-Trial Resp. Br.") at 11-14; Tr. 109:3 to 111:2 (Test. of Hayslett).

In aggregate, the storage space provided by the SNF pools at Browns Ferry 1 & 2, Browns Ferry 3, and Sequoyah 1 & 2 totals approximately 2,870 MTU. DX 311 at 2-4. If TVA provides for one full core reserve at each of the three pools, the available capacity is approximately 2,500 MTU. Tr. 60:25 to 61:3 (Test. of Hayslett); DX 311 at 2-4. Analysis of the capacity of TVA's storage pools is unchanged whether one looks at the pools individually or in the aggregate. Tr. 220:9 to 221:11 (Test. of Holton). This is due to the fact that TVA could decide how to

apportion the available disposal allotments under the Standard Contract across its plants. Tr. 83:5-19 (Test. of Hayslett), 221:13 to 223:3 (Test. of Holton). TVA and DOE each made estimates as to the amount of SNF that TVA would generate each year; the differing estimates are illustrated in their calculated "cumulative discharges." PX 85 (Summary of DOE Model Results – TVA Projected Discharges); PX 86 (Summary of DOE Model Results – DOE Projected Discharges). TVA's internal estimates of SNF production are slightly higher than those of DOE, attributable primarily to the fact that TVA assumes that its nuclear plants will be offline for a shorter time than DOE estimates. Tr. 69:14 to 70:7 (Test. of Hayslett), 262:1-6 (Test. of Holton). Using the "TVA 3,000" SNF acceptance assumptions, TVA would have been able to stay within the storage capacity of its pools. Tr. 72:9 to 73:6 (Test. of Hayslett); PX 85; PX 86; DX 311. According to TVA's internal SNF discharge forecast, TVA's storage needs would have reached their maximum in 2018. In 2018, TVA would have had approximately 2,391 MTU of SNF; this amount is within the aggregate capacity of the pools minus full-core reserves. PX 85.

The government suggests that the timing of DOE's collection during any given year is unknown (*i.e.*, new SNF might be unloaded before DOE might make its collection for that year), and as a result TVA might have been forced to encroach on full core reserve in parts of a number of years at each of its facilities. TVA responds that it would have had several options to deal with such a scenario, and in any event, it would not have built dry storage as a result of such temporary encroachments on full core reserve. *See* Tr. 1231:3 to 1241:8 (Test. of Holton). TVA's Mr. Holton indicated that TVA's current business practices allow it temporarily to encroach on full core reserve and that it has done so in the past. *See id*. at 1233:10 to 1234:8. Additionally, Mr. Holton noted that the Standard Contract allows TVA to request that DOE increase its annual allocations by 20%, and the contract also includes a provision that would allow a utility to exchange allotments with other utilities if that utility faces SNF capacity limitations. *Id*. at 1234:13 to 1235:4, 1237:10-14. Temporary cask-pit storage may also have been an option, *see id*. at 1237:14-19, particularly at Browns Ferry, which is not participating in the tritium program.

TVA also avers that it would not have been required to build dry storage even if one adopts the rate of SNF acceptance that the government advocates (the "DOE 3,000" rate), in which DOE would not have ramped up to collection of 3,000 MTU/year until 2015. *See* Pl.'s Initial Post-Trial Resp. Br. at 11-14; *see also* Tr. 109:3 to 110:5 (Test. of Hayslett). Using DOE's projected discharges for TVA, TVA's maximum SNF storage needs would have reached 2,774 MTU in 2018, PX 86; using TVA's more conservative estimates, TVA's storage needs would have reached a maximum of 2,933 MTU in 2018. PX 85. While both of these figures exceed the available capacity of 2,500 MTU in TVA's storage pools, this does not end the analysis. Given the proportionately large cost of building and operating dry storage facilities, TVA would have had several options available in the but-for scenario to deal with its spent fuel while still avoiding dry storage. These options included encroachment on full core reserve, increasing TVA's allotments with DOE, exchanging allotments with other utilities, cask-pit

storage, and transshipment of SNF to other plants.[18] *See* Tr. 109:3 to 111:2 (Test. of Hayslett). As described *supra*, at 20, TVA has been willing to encroach on full-core reserve on occasion, potentially increasing TVA's pool storage space to some 2,870 MTU over a short period. Additionally, as discussed *supra*, at 20, the Standard Contract included a provision allowing utilities to request that DOE increase or decrease SNF allocations for a given year by as much as 20%, as well as a provision allowing for "swaps" of allocations between utilities. *See* JX 1 arts. V.B.2, V.E. Mr. Hayslett indicated that successful invocation of the "plus or minus 20%" provision alone could have resulted in additional collection of 240 MTU by DOE through 2018. Tr. 109:20 to 110:5 (Test. of Hayslett). The government disputes the viability of the "plus or minus 20%" provision, claiming that any action taken under this provision would likely have to have been approved by DOE, and that any increase for one utility would result in a decrease for another utility. *See* Def.'s Initial Post-Trial Br. at 24-25; Tr. 1509:23 to 1515:16 (Test. of Kouts). However, a witness for the government and a witness for TVA both expressed an understanding that the Standard Contract would require DOE to accommodate a request by a utility under the "plus or minus 20%" provision. *See* Tr. 921:6 to 922:7 (Test. of Zabransky), 1235:23 to 1236:16 (Test. of Holton).

The government also disputes the viability of the exchange provision, claiming that because there is currently no defined market in SNF exchanges and there are no formal criteria in place to allow for exchanges, it would be speculative to estimate the actual amount that any given utility could transfer under these provisions. *See* Def.'s Initial Post-Trial Br. at 20-23. The government's posture in this regard, however, is unavailing. That a market would develop around the exchange provision of the Standard Contract is supported by experience with other regulatory-based exchange arrangements, including those associated with environmental emissions programs under the Clean Air Act. *See* 42 U.S.C. § 7651b(b) (sulfur dioxide allowance transfer system); *Clean Air Markets Group v. Pataki*, 338 F.3d 82, 87-89 (2d Cir. 2003) (New York law restricting utilities' ability to transfer emissions allowances created actual conflict with federal law authorizing allowances to be transferred and was preempted). Tellingly, it is significantly less speculative that a market would develop around the SNF-exchange provision in the Standard Contract than that government's overall mitigation-limiting scenario would actually unfold. Overall, given the number of viable alternatives available to TVA, the court finds that TVA would have been able to avoid the need to build dry storage facilities, even under the "DOE 3,000" acceptance rate assumptions.

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[18]TVA also suggests that it might have invoked a provision in the Standard Contract that provided for emergency collection of SNF. Tr. 99:6-10 (Test. of Hayslett); Pl.'s Initial Post-Trial Resp. Br. at 11-12; *see* JX 1 (Standard Contract) art. V.D. It is unlikely, however, that exceeding SNF pool capacity would qualify as an "emergency" as envisioned by the Contract, and therefore the court will not give credit to use of the "emergency" provision as a viable option available to TVA. *See* Tr. 2455:4 to 2456:25 (Test. of David K. Zabransky, DOE's Contracting Officer).

The government has not met its burden of showing that TVA would have had to pursue dry storage even if DOE had performed under the contract, and the court therefore rejects the government's assertion that TVA's damages should be limited as a result.

D. The Government's Challenges to TVA's Claimed Damages

The bulk of TVA's claimed damages consists of costs of equipment, materials of construction, and professional and other outside services purchased or hired to design and construct the dry storage facilities at Sequoyah and Browns Ferry. *See supra*, at 12 (charts listing expenditures by category). Only a few of the purchased or hired items are disputed by the government. TVA has, however, also claimed as damages certain of its allocated internal charge-backs, and the government has challenged most of these charge-backs. Each of the disputed items, whether attributable to external or internal sources, will be analyzed in turn.

1. *External contractors.*

TVA's claim includes $28,632,647.13 in the cost category labeled Contract Services and Procurement. *See supra*, at 12. The government avers that TVA's claim for this category should be reduced by $716,503. Def.'s Initial Post-Trial Br. at 38, 42.[19] TVA has stipulated that $58,970 should be removed from its claim for this category.[20] Therefore, the government seeks a further reduction of $657,533 from TVA's requested damages award. *See* Def.'s Initial Post-Trial Br. at 38, 42. Of this amount, $280,000 of the requested reductions relate to technical studies performed at Sequoyah and Browns Ferry. The remaining $377,532 in claimed reductions relate to outside-contractor costs at Browns Ferry ($131,512) and Sequoyah ($246,020).

[19]The government's Initial Post-Trial Brief lists $470,483 as the amount by which contract services and procurement should be reduced. Def.'s Initial Post-Trial Br. at 38. This claimed reduction does not include $246,020 attributable to Stone & Webster Core Team expenses at Sequoyah. The government seeks that reduction under "Overhead" costs. Def.'s Initial Post-Trial Br. at 42. However, the Stone & Webster Core Team expenses are properly classified as contract services and procurement, bringing the government's total requested deduction in this category to $716,503.

[20]Of this amount $10,970 relates to the $21,074 in auxiliary building crane expenses that TVA has stipulated should be removed from its damages claim, s*ee supra*, at 12-13, and it likewise has stipulated that $48,000 in costs relating to a study by Holtec of the adequacy of existing fuel racks at Browns Ferry is unrecoverable. *See supra*, at 13.

(a.) *Technical studies.*

The government claims that studies performed by Holtec at Browns Ferry costing $180,000 are not recoverable by TVA (in addition to the reduction of $48,000 to which TVA has already stipulated). Def.'s Initial Post-Trial Br. at 39-40; Tr. 2101:20 to 2102:19 (Test. of Stephen J. Kiraly); DX 218 (Report of Stephen J. Kiraly (Mar. 29, 2005)) Exs. 3.2, 3.2.2. The studies contested by DOE all relate to evaluations performed by Holtec of particular aspects of the safety of its storage-cask design. The government points to evidence that TVA, in its own internal review of the proposed Browns Ferry contract with Holtec, stated that these "analyses . . . are not required to design, construct and operate a dry cask storage facility at [Browns Ferry] and were not contracted for at [Sequoyah]." DX 270 (Review of Proposed Contract for BFN Dry Storage (Oct. 10, 2001)), at TVA 04 28078-9; *see* Tr. 425:22 to 430:18 (Test. of Davis). TVA's internal review of the Browns Ferry contract goes on to state that analyses had been previously performed by Holtec to demonstrate the safety of the casks, and that such analyses would not be repeated specific to a site. DX 270 at TVA 04 28079. However, Mr. Chapman, TVA's project manager for the dry storage facility at Browns Ferry, testified that each of these studies was performed on a site-specific basis for Browns Ferry because they were necessary for the construction of the dry storage facility at Browns Ferry. Tr. 629:2 to 641:10 (Test. of Chapman). Essentially, with respect to these studies, Mr. Chapman stated that even though the Holtec casks were generically approved, such approval did not cover all aspects of their safe operation at Browns Ferry because of that facility's circumstances. *Id*. at 661:23 to 665:2. Mr. Chapman's testimony covered the reasons each study was undertaken for Browns Ferry.

The "Design Basis Thermal Analysis" was performed for Browns Ferry because the dry storage facility there was using a long and narrow 4 by 96 storage-cask array, an arrangement which had not previously been the subject of safety analysis. Tr. 629:6 to 631:14 (Test. of Chapman). The "Design Basis Criticality Analysis" ($10,000) was conducted to examine the specific spent fuel that TVA had on site at Browns Ferry to determine if it could be safely stored in a Holtec cask. *Id*. at 631:15 to 632:23. The "Cask Tipover Analysis" ($5,000) was performed for Browns Ferry because the Browns Ferry project was adopting a new version of Holtec's cask that had not previously been evaluated, and this specific cask needed to be evaluated against the site-specific conditions at Browns Ferry. *Id*. at 632:24 to 633:24. The "Cask Carry Height Calculation" ($5,000) addressed the height at which casks could be carried by the crawler without breaking open if a cask fell to the ground, taking into account the specific road surfaces that were installed at Browns Ferry. *Id*. at 633:25 to 635:7. The "Transfer Cask Analysis" was performed to evaluate the stability of the Browns Ferry buildings in which fuel loading would take place, specifically with respect to their performance in an earthquake. *Id*. at 635:8 to 637:2. The "Blocked Duct Analysis" ($20,000) and "Buried Storage Overpack Analysis" ($15,000) were performed by Holtec to determine the amount of time it would take for the casks to overheat if their ventilation ducts were blocked; although Browns Ferry is not in a flood-prone area (unlike Sequoyah), it is in a tornado-prone area and the blocked-duct and buried-storage-overpack analyses were conducted to address the possibility that the dry storage area could be strewn with debris from a tornado. *Id*. at 637:3 to 638:21. Mr. Chapman testified that the "MPC

Brittle Lid Fracture Analysis" ($10,000) was run to ensure that an MPC cask would not be dropped onto a piece of equipment called a suppression pool, which is essential in performing emergency cooling and which is located directly below the loading area at Browns Ferry. *Id*. at 638:22 to 640:8. Finally, Mr. Chapman testified that the "MPC Analysis" ($25,000) was not necessary to implement dry storage at Browns Ferry, but this analysis was performed to determine if the MPC could be used as a transportation cask. *Id*. at 640:9-18. Mr. Chapman noted that DOE has not approved any canister for transportation to date. *Id*. at 640:19 to 641:10.

The court finds that the costs of the studies other than the "MPC Analysis" were necessary to the construction or operation of the Browns Ferry dry storage project. The Court finds that the "MPC analysis" was unnecessary, and therefore should not be compensable, because DOE will be required to approve any canister that will be used for transportation at some time in the future. The court therefore will reduce TVA's damages for studies performed at Browns Ferry by $25,000.

An analysis of the railroad bay floor at Sequoyah ($100,000) was performed because the weight of each of the Holtec casks to be used there was projected to be approximately 270 tons, and that weight would be borne over a relatively small area. Tr. 324:10 to 325:9 (Test. of Davis). The railroad bay floor was originally designed to hold weights up to 100 tons spread over the length of a railroad car. *Id*. The government claims that this analysis would have had to be performed in the non-breach, but-for world and therefore should be non-compensable. Def.'s Initial Post-Trial Br. at 40-41; Tr. 1899:3-15 (Test. of Warren K. Brewer). However, the government's approach assumes that DOE would have used casks that are of the same size and weight as the Holtec casks being used for dry storage. It is wholly speculative to assume that DOE would use the same type of cask and loading arrangement as that employed for dry storage. *See* Tr. 1900:16-20 (Test. of Brewer). Moreover, if DOE had performed using railcars, the railroad-bay analysis might not have been necessary because the railroad bay had been designed for that contingency in the first instance. Tr. 321:6-20 (Test. of Davis). Finally, an analysis of the railroad-bay floor may have to be repeated at some point in the future when DOE begins to perform, depending upon what type of pick-up means and transport container DOE chooses to employ. The court finds that TVA was reasonable in conducting a railroad-bay analysis at Sequoyah, and the government does not present sufficient evidence to disallow the cost of that analysis.

(b.) *Work by Stone & Webster.*

The government contends that the amount that TVA seeks to recover for work of Stone & Webster "Core Teams" on the Browns Ferry and Sequoyah dry storage projects ($377,532) is not recoverable because the costs of the Core Teams are fixed and therefore are not incremental to the breach. Def.'s Initial Post-Trial Br. at 41-42; Tr. 2100:14 to 2101:19 (Test. of Kiraly). Each Core Team consists of a group of Stone & Webster employees that provide construction and engineering services to TVA. Tr. 327:16 to 328:4 (Test. of Davis). This activity includes conducting security background checks on Stone & Webster employees and providing payroll

and related services. PX 43 (TVA Report of FY 2004 Costs (Nov. 2004)), at 4. TVA's claimed damages for Browns Ferry and Sequoyah include an allocation for the portion of Core Team-related expenses that was spent on the dry-storage project. Tr. 436:7 to 438:21 (Test. of Davis). The Core Team's staffing varied depending upon work load, and TVA's allocation of the Core Team's expenses was based upon the percentage of total Stone & Webster costs that were attributed to the dry storage projects over a given time period. Tr. 526:10 to 528:7 (Test. of Walker) (describing allocation of Stone & Webster Core Team costs to the Sequoyah project). The court finds that allocation of the Stone & Webster Core Team's expenses to the dry storage construction projects was reasonable, corresponding to the time TVA has demonstrated that Stone & Webster spent on the projects. In short, the government has not met its burden for proving that the Stone & Webster Core Team expenses should be excluded from the allowable costs attributable to the dry storage projects.

2. *TVA-owned heavy equipment.*

The government challenges $175,071 in claimed internal charge-backs related to heavy equipment supplied to the projects by TVA's Heavy Equipment Division. Def.'s Initial Post-Trial Br. at 37-38. TVA's Heavy Equipment Division supplies equipment for use by all parts of TVA; the equipment is requested by TVA units and sent out to projects on the understanding that specified costs varying by type of equipment will be charged to the pertinent project. Tr. 540:10 to 542:1 (Test. of Walker). The Division has approximately 235 permanent employees and 150 staff-augmentation employees. Tr. 724:5-23 (Test. of Roy J. Gaylon, Manager of TVA's Heavy Equipment Division). The Division owned resources consisting of approximately 2,200 units. *Id*. at 725:4-18. It leases equipment when necessary; during 2003-2004, it leased some 800 outside rental units, and it was leasing approximately 475 units as of June 2005. *Id*. at 726:8-10. The Division is run as a zero-profit organization within TVA; *i.e.*, it only endeavors to recover the costs of its operations without markup. *Id*. at 727:16 to 728:3. Its overall costs of operation approximated $80 million in 2004. *Id*. at 727:9-15. The rates specified for particular types of equipment are calculated based on the depreciation of the equipment as well as the costs of operating the equipment (operators are supplied with the equipment). *Id*. at 729:17 to 730:11. The heavy equipment that TVA used on the work at the Sequoyah and Browns Ferry projects was a mix of owned and rented equipment. Rental equipment was charged to the projects as a pass-through expense. Owned equipment was charged at the rates specified by the Heavy Equipment Division. *Id*.

The government claims that TVA should not be allowed to recover for use of its owned equipment, on the ground that the equipment was owned by TVA and thus did not represent an incremental cost. Def.'s Initial Post-Trial Br. at 37; Tr. 2107:8-21, 2109:2-12, 2111:21 to 2112:3 (Test. of Kiraly); *see* DX 218, Exs. 4.1, 4.1.1, 4.2, 4.2.1; DX 218A (Comparison of Kiraly Report and Post-Report Adjustments), Exs. 4.1, 4.1.1, 4.2, 4.2.1. The government's expert opined that the TVA-owned equipment should not be treated as incremental because TVA produced no proof that the equipment would have been used elsewhere. Tr. 2111:23 to 2112:3 (Test. of Kiraly). However, the manager of TVA's Heavy Equipment Division testified at trial that any owned

equipment used on the dry storage projects was, by necessity, not available for use at other TVA projects. Tr. 736:18 to 737:19 (Test of Gaylon). Mr. Gaylon testified that TVA's owned fleet has a utilization rate of 80%-85%, significantly higher than the rate of 60%-70% achieved by comparable rental companies. *Id*. at 726:11 to 727:2. Considering that some equipment will inevitably be down for repairs at any given time, Mr. Gaylon testified that a utilization rate of 80%-85% is roughly equivalent to "full utilization" of the Heavy Equipment Division's owned equipment. *Id*. at 739:6 to 740:9. Given these circumstances, and the fact that TVA leases additional heavy equipment beyond that supplied by the Division, the court accepts that the TVA-owned equipment used on the dry storage projects was not available to TVA for use on other projects and that TVA would have been able to put the owned equipment that was used on the dry storage construction projects to use in some other capacity had it not been for DOE's breach and TVA's resulting mitigation efforts.

That TVA's Heavy Equipment Division owns equipment used on the dry storage projects does not disqualify the associated charges from being included in TVA's mitigation damages. As the Second Circuit held in *United States v. The John R. Williams*, 144 F.2d 451 (2d Cir. 1944), the government was allowed recovery of damages for the use of one of its vessels in repairing a cable, notwithstanding the contention that damages should be denied because the government owned and operated the vessel and thus incurred no incremental costs. *Id*. at 452-53. The converse is also true; *i.e.*, a claimant against the government should not be denied recovery of damages for mitigation merely because it uses equipment owned by the claimant in its mitigating actions.

Moreover, granting the government's request with regard to TVA's owned equipment would have the perverse effect of penalizing TVA for taking cost-effective steps to mitigate damages. TVA's rental rates for equipment are approximately 70% of the market rental rate for comparable equipment, Tr. 730:12 to 731:22 (Test. of Gaylon), with the result that TVA avoided 30% of the market cost by using some of its own equipment in the dry storage construction projects rather than always renting outside equipment. The court refuses to penalize TVA for its thrift and cost-effective operations.

In short, the court will not reduce TVA's damages because it used TVA-owned equipment.

3. *Internal labor.*

The government avers that TVA's damages should be reduced to exclude many of TVA's internal charge-backs relating to work performed by TVA employees. *See* Def.'s Initial Post-Trial Br. at 35-37, 42-43. The government contends that the challenged expenses should be excluded from damages because TVA would have paid its employees for their work regardless of DOE's breach. *Id.* In support of its position, the government recites the general proposition that a non-breaching party "is not entitled to recover 'expenses which would properly have been incurred regardless of the [breach].'" *Boyajian v. United States*, 423 F.2d 1231, 1236 (Ct. Cl.

1970) (quoting *Saddler v. United States*, 287 F.2d 411, 415 (Ct. Cl. 1961)); *see* Def.'s Memorandum of Facts and Law ("Def.'s Tr. Memo.") at 46.

TVA supports inclusion of the internal labor charges on the grounds that they were incurred in, and necessary to, its mitigation of damages, that the charges were accurately recorded and allocated to the dry storage projects, and that the use of TVA's internal resources obviated the need to retain outside contractors and purveyors of services to do the necessary work. Pl.'s Initial Post-Trial Br. at 26-28, 36-43. Moreover, TVA contends that its use of its own skilled engineers to perform much of the technical work produced significant cost savings compared to the charges that would have been incurred using outside firms. *Id*. at 27-28. TVA cites a set of cases that approve inclusion of internal charges in damages where the claimant showed that the work involved was necessary and appropriate to mitigate damages. *Id*. at 36-38 (citing *Freeport Sulphur Co. v. The S/S Hermosa*, 526 F.2d 300, 303-304 (5th Cir. 1976) (internal engineering work to support repair of a dock); *The John R. Williams*, 144 F.2d at 452-53 (use of a government-owned and operated vessel to repair a cable); *The Commonwealth*, 297 F. 651 (S.D.N.Y. 1923) (Circuit Judge Mack) (awarding damages to the United States for the use of a government-owned dry dock to make repairs to a governmental vessel)). The government dismissively comments that these precedents cited by TVA are "tort cases, of little or no relevance to this breach of contract case." Def.'s Responsive Post-Trial Br. at 15.

Given the sharply contrasting legal arguments of the parties over the propriety of including a mitigation party's internal charges in a damages award, a wide-ranging inquiry has been undertaken to explore the parties' contentions. The government is correct that some of the precedents cited by TVA are tort cases governed by federal law. The pertinent question is whether the causation principles applied in those decisions pertain to damages for breach of contract as well as for torts. *The John R. Williams*, 144 F.2d 451, was an admiralty case sounding in tort that was ultimately affirmed on common law grounds. The opinion by Judge Augustus Hand for the Second Circuit discloses that the United States sought to recover from a shipowner the costs of repairing an underwater communications cable that had been severed by the shipowner's vessel. *Id*. at 452-53. The repair expenses included the operating costs of a government-owned cable repair vessel, including fuel and water for the vessel and pay and rations for her crew. *Id*. at 452. The shipowner challenged recovery of these expenses on the basis that they were necessary costs of maintaining a vessel that the United States regularly kept for repairing cables. *Id*. at 452-53. The shipowner showed that the time spent repairing the damaged cable did not divert the repair ship from other repair work and therefore did not cause the government to incur additional costs. *Id*. at 453. The Second Circuit determined that the United States could nonetheless recover the costs of operating the vessel, on the rationale that "if the government had not maintained such a vessel it would have had to employ an outside contractor to make the repairs." *Id*. The court of appeals cited as support a number of decisions in which recovery had been allowed for use of "spare boats" that "might not have been otherwise used at the time." *Id*. (citing *The Favorita*, 85 U.S. (18 Wall.) 598 (1873); *The Cayuga*, 81 U.S. (14 Wall.) 270 (1871); *The Mayor*, 36 F. 716 (S.D.N.Y. 1888)). Also, the earlier decision in *The Commonwealth*, 297 F. at 655, is to the same effect: "That the government had other docks

which were not in use, or that it was not likely to be and actually was not called upon at this time to use any of them commercially, should not differentiate its claim from that of a private ship and dock owner in a like situation using one of his otherwise unused docks for the repair of his own ship."

In a further federal admiralty case sounding in tort, *Freeport Sulphur*, 526 F.2d 300, the plaintiff sought to recover the cost of engineering work performed by its employees in the course of repairing a dock that was damaged by the defendant's vessel. *Id*. at 302-03. The vessel's owner averred that the plaintiff should not recover the costs of its own salaried engineers and draftsmen because using their services did not impose additional expense on the plaintiff. *Id*. at 303. The shipowner's rationale was that the plaintiff had arranged with an outside engineering concern to provide engineering work when its own resources were exceeded, and the outside engineering firm was not engaged during the time that the plaintiff's own engineers worked on the dock repair project. *Id*. at 303. The failure to engage the outside firm, the defendant claimed, showed that the plaintiff's own engineers would otherwise have been idle and therefore that the dock repair was accomplished without any additional expense or overhead. *Id*. In an opinion by Judge Wisdom for the Fifth Circuit, the court of appeals rejected the defendant's argument as "speculation" because "[i]t [was] at least as plausible that there were other . . . projects that would have been worked on by [plaintiff's] internal engineers, but were not of such an emergency nature that [the company] required the immediate employment of the outside firm." *Id*. Notably, the plaintiff firm had kept proper records, its rates were reasonable, and use of its own engineers resulted in a net saving to the defendant. *Id*. at 303-04.

The causation concepts in these common law and federal maritime tort cases carry over to an assessment of damages in a breach-of-contract setting, albeit in modified form. In *Convoy Co. v. Sperry Rand Corp*., 672 F.2d 781 (9th Cir. 1982), a breach of contract case based on Oregon law, the plaintiff sought to recover the costs of the hours its salaried personnel spent supervising an unsatisfactory computer system that the plaintiff had purchased from the defendant. *Id*. at 785. The defendant argued that supervisory staff costs could not be recovered because the plaintiff would have paid the employees' salaries regardless of the breach. *Id*. The defendant cited two prior decisions, *AES Technology Systems, Inc. v. Coherent Radiation*, 583 F.2d 933 (7th Cir. 1978), and *Wilson v. Marquette Electronics, Inc.*, 630 F.2d 575 (8th Cir. 1980), for the proposition that a "plaintiff is not entitled to recover fixed expenses which do not increase by virtue of any wrongful conduct of the defendant." *Convoy*, 672 F.2d at 785. In *AES Technology*, the plaintiff had sought to recover for salaries paid to workers assigned to a project that was adversely affected by a defective laser purchased from the defendant. *Id*. The court refused to allow recovery because "[p]roblems with the [l]aser did not prohibit AES employees from working on other projects." *AES Tech.*, 583 F.2d at 942. Similarly, in *Wilson* a physician who was employed by the plaintiff for the purpose of reading electrocardiograms ("ECGs") was required to spend additional time with an ECG machine because it was defective, and the plaintiff sought to recover for this time. 630 F.2d at 586. The court denied recovery on the grounds that there was no evidence "that the corporate [plaintiff] lost any money due to the extra time [the doctor] was forced to spend on [the ECG part] of his business." *Id*. However, the

Ninth Circuit distinguished the situation in *Convoy* from those in *AES Technology* and *Wilson*: "The issue is not whether [the plaintiff] would have paid the supervisors' salaries if the defendant had not breached the contract, but *whether the breach deprived [the plaintiff] of the services it paid for*." *Convoy*, 672 F.2d at 785 (emphasis added). The approach in *Convoy* was cited with approval by the Sixth Circuit in *Dunn Appraisal Co. v. Honeywell Information Systems, Inc.*, 687 F.2d 877, 884 (6th Cir. 1982)(applying the reasoning in *Convoy* to hold that a chief executive officer's salary could be recovered by his employer to the extent he spent time dealing with a problem caused by the defendant's defective equipment).

The court concludes from these precedents that the appropriate legal standard for evaluation of TVA's claimed internal labor charge-backs is that set out in the *Convoy* and *Dunn Appraisal* cases. In accord with those decisions, as well as federal common law and maritime tort precedents such as *The John R. Williams* and *Freeport Sulphur*, the fact that TVA used its own internal resources to support its mitigation is not fatal to its claim for damages in mitigating a breach of contract. Rather, the test for recovery is a targeted one: whether use of the internal resources by TVA deprived it of the ability to employ those resources on other projects. That TVA would have paid its employees in all events is not material to this inquiry.

(a.) *Charge-backs from TVA internal service organizations.*

TVA seeks to recover charge-backs for its internal allocations of professional services performed by TVA's Nuclear Corporate Engineering group ($1,813,175), Nuclear Inspection Services organization ($277,530), and Transmission Internal Services organization ($38,910). Pl's Initial Post-Tr. Br. at 26. The government avers that none of these charge-backs should be recoverable, maintaining that the costs to TVA of the services provided by these units were fixed and not incremental to the breach. Def.'s Initial Post-Tr. Br. at 37; Tr. 2105:5 to 2107:3 (Test. of Kiraly); DX 218 Exs. 4.1, 4.2.

TVA's Nuclear Corporate Engineering group consists of both permanent employees and staff-augmentation (temporary) employees, who are hired as TVA's internal workload increases. Tr. 529:8-18 (Test. of Walker). In this respect, the Nuclear Corporate Engineering group operates much like the Heavy Equipment Division, adding capacity as needs increase. *See supra*, at 25-26. Also like the Heavy Equipment Division, Nuclear Corporate Engineering operates as a cost-recovery entity within TVA, charging organizations within TVA for their services to cover expenses without markup. Tr. 529:19-23 (Test. of Walker). Because the Nuclear Corporate Engineering group's operations reflect a strategy of maintaining no more head count than it requires at any given time, the court will allow TVA to recover the internally allocated costs expended for the services provided by this organization. The Nuclear Corporate Engineering group charges between $52 and $56 an hour; this compares favorably with $75 to $100 an hour for external engineers. *Id*. at 529:8 to 530:25.

The Nuclear Inspection Services organization provides TVA's internal quality control services. Tr. 538:17-20 (Test. of Walker). Nuclear Inspection Services has some permanent

staff, but TVA adjusts the level of staffing by hiring outside contractors. *Id*. at 538:22 to 539:1. Mr. Walker of TVA testified that Nuclear Inspection Services employs "hourly employees, meaning that they are paid only for [the] hours that they work. They're not salaried." *Id*. at 539:2-5. The majority of the Nuclear Inspection Services personnel employed by TVA on the Sequoyah and Browns Ferry Projects were contract (temporary) employees. Tr. 540:6-9 (Test. of Walker), 615:12-24 (Test. of Chapman). The court accordingly will allow TVA to recover the Nuclear Inspection Services costs allocated to the dry storage projects.

TVA's Transmission Internal Services organization performed surveying services for the dry storage project. Pl.'s Initial Post-Tr. Br. at 28; Tr. 2105:17-19 (Test. of Kiraly). TVA's Mr. Davis testified that many of the employees used for surveying at the dry storage projects were contractors. Tr. 333:3-22 (Test. of Davis). Again, just as with TVA's Nuclear Corporate Engineering and Nuclear Inspection Services groups, TVA's Transmission Internal Services organization provided surveyors on an as-needed basis, and when they were so employed, they were unavailable for other work. The court will allow TVA to recover these costs.

(b.) *Charge-backs for use of salaried staff at Sequoyah and Browns Ferry.*

TVA seeks to recover $1,401,283.44 in this category of labor. *See* Pl.'s Initial Post-Tr. Br. at 23. The government avers that $669,841 of TVA's claimed labor costs paid to salaried employees should be non-recoverable because those costs were fixed and not incremental to the breach. Def.'s Initial Post-Tr. Br. at 35-37; Tr. 2057:18 to 2064:12 (Test. of Kiraly); DX 218A Exs. 1, 2.1, 2.1.2, 2.2, 2.2.2. TVA has stipulated that $6,412 of these labor costs should be eliminated because these costs were part of the $21,074 of excluded costs associated with the upgrade of the Auxiliary Building crane. *See* Def.'s Initial Post-Tr. Br. at 35 n.4; DX 218 Ex. 2.1.1. Therefore, the government requests a further reduction of $663,429.

TVA calculated its costs for charge-backs of salaried staff at Sequoyah and Browns Ferry based upon the records in its Integrated Business System general ledger. *See* PX 68 (Integrated Business System Transaction Reports for Sequoyah (FY 1998-2004)); PX 69 (Integrated Business System Transaction Reports for Browns Ferry (FY 1998-2004)). These ledgers set out charge-backs in terms of costs, but they did not contain a break-down by hour on an employee-by-employee basis. *See* Tr. 2065:10-21 (Test. of Kiraly); DX 218 at 5. The government's expert, Mr. Kiraly, originally opined that charge-backs for all salaried personnel at Sequoyah and Browns Ferry should be eliminated on the ground that the labor involved was not "incremental." Tr. 2058:1 to 2061:8 (Test. of Kiraly). Subsequently, TVA provided Mr. Kiraly with labor data from the Sequoyah and Browns Ferry projects on an employee-by-employee basis. *Id*. at 2081:14 to 2082:1. Mr. Kiraly analyzed these data to determine whether each employee should be considered "incremental" and therefore recoverable. To be considered "incremental," Mr. Kiraly determined that an employee needed to work on the dry storage project for a minimum of 12 weeks, and to spend a minimum of 50% of his or her time on the dry storage project. *Id*. at 2146:14 to 2147:2, 2163:13 to 2164:20. Based upon these standards, Mr. Kiraly determined that two employees at Sequoyah (Charles R. Davis and Michael A. Edwards) and three employees at

Browns Ferry (Robert A. Chapman, Judith B. Border, and John L. Symonds) should be treated as "incremental." DX 218A Exs. 2.1.2, 2.2.2. Based upon the labor data and Integrated Business System data provided by TVA, Mr. Kiraly estimated the costs associated with these employees, and added this amount of salaried labor back to the labor category in his expert report. *Id*.

TVA objects to Mr. Kiraly's criteria and methodology as arbitrary. TVA particularly contests his "50%" criterion. Pl.'s Initial Post-Trial Br. at 38-39. In this respect, the court agrees that reference to an "incremental" test is inappropriate because it does not fully reflect whether an employee was precluded from other work, and, in the same vein, use of a "50%" criterion as a surrogate is not supportable. Nonetheless, TVA's proofs respecting its internal charge-backs for salaried staff at Sequoyah and Browns Ferry leave much to be desired. TVA did not provide detailed hours and amounts per employee in its ledger reports. TVA's proofs also do not indicate the actual services provided by most of the pertinent salaried staff at the two facilities, nor does the evidence disclose the extent to which most of the employees were committed to the dry storage projects. By contrast, TVA did make an appropriate showing respecting the work of Messrs. Davis, Edwards, Chapman, and Symonds, and Ms. Border. The court accordingly concludes that charge-backs for these individuals are recoverable by TVA but that the remaining charge-backs are not.[21] The court consequently allows TVA to recover charge-backs for use of salaried staff at Sequoyah and Browns Ferry of $731,442.44, but disallows charge-backs of $663,429.00.

4. *Allowance for funds used during construction ("AFUDC").*

The government seeks to exclude from TVA's recoverable damages a category of costs called Allowance for Funds Used During Construction ("AFUDC"). Def.'s Initial Post-Trial Br. at 43-44. As a matter of course, TVA calculates the AFUDC for each capital project and adds the cost of funds used during the construction of that capital project to the cost of a capital project. The AFUDC-inclusive cost of the capital project is then used by the TVA as a factor in setting its rates. Pl.'s Damages Trial Memo. at 22. Inclusion of AFUDC in a utility's capital costs is an industry-wide practice that is consistent with requirements promulgated by the Federal Energy Regulatory Commission ("FERC"). *See* 18 C.F.R. pt. 101 Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act ("Uniform Systems of Accounts"), Electric Plant Instructions, ¶ 3.A(17) (stating that AFUDC

[21]Other salaried employees at Sequoyah and Browns Ferry spent considerable amounts of time on work that was allocated internally to the dry storage projects. These employees included Lynn Bettis, Terry Lee, Jeffrey Nauditt, William Pinson, Christopher Garner, Ronald Rogers, Rudy Roussel, David Thompson, and David Whitehead. *See* DX 218A Ex. 2.2.3. Each such employee recorded over 250 hours of working time on the Browns Ferry project, and some of them worked considerably more (*e.g.*, Mr. Whitehead recorded 919.5 hours on the Browns Ferry project over 54 weeks and Mr. Thompson recorded 760 hours over 92 weeks). However, the evidence does not indicate what function these persons performed on the dry storage projects or what they otherwise were doing.

"includes the net cost for the period of construction of borrowed funds used for construction purposes and a reasonable rate on other funds when so used"). In TVA's case, TVA's cost of capital is equal to the interest rate that it pays on debt; as an entity of the federal government, TVA finances capital projects either through operating cash flows or through debt, and has no equity. Tr. 699:7 to 700:5 (Test. of Andrew W. Holmes, TVA's Senior Manager of Accounting and Performance Reporting), 2308:13 to 2309:4 (Test. of Hartman); Parties' Stipulations on AFUDC ("AFUDC Stip.") ¶¶ 8-9.

TVA calculates the AFUDC for each project on a consistent basis. Each month, TVA calculates the cumulative cost expended by all of TVA's organizations for construction work in progress. AFUDC Stip. ¶¶ 2-3. This cumulative amount constitutes TVA's "AFUDC Base." *Id*. TVA calculates an average Corporate AFUDC Base for the month, then determines the average monthly interest rate it has been charged on all of the long- and short-term debt it has issued to finance the capital expenditures and operating costs of all of its corporate divisions or organizations ("AFUDC Monthly Interest Rate"). *Id*. at ¶ 4. TVA then applies the AFUDC Monthly Interest Rate to the average prior-month AFUDC Base to calculate the total AFUDC for all of TVA. *Id*. TVA then allocates AFUDC to each of the capital projects pro rata, based upon the percentage that project's capital costs bear to the organization's total capital project costs. *Id*. at ¶¶ 5-6. This methodology comports with the instructions for calculating AFUDC provided in FERC's Uniform System of Accounts. *See* 18 C.F.R. pt. 101, Uniform System of Accounts, Electric Plant Instructions, ¶ 3.A(17).

The leading precedent in this circuit for recoverability of AFUDC as damages is *Wickham Construction Co. v. Fischer*, 12 F.3d 1574 (Fed. Cir. 1994). In *Wickham*, a contractor sought to recover from the government interest paid on funds that it borrowed to finance a construction contract that was delayed due the government's breach. *Id*. at 1582. The Federal Circuit determined that "[a]lthough interest on equity capital is not recoverable, a contractor *may recover interest actually paid on funds borrowed* because of the government's delay in payments and used on the delayed contract." *Id*. (citing 28 U.S.C. § 2516(a)) (emphasis added). Section 2516(a) of Title 28 of the U.S. Code "generally prohibits the award of interest against the federal government," but "does not bar an interest award as part of an equitable adjustment under a fixed-price contract if the contractor has actually paid interest because of the government's delay in payment.'" *Id*. at 1582-83 (quoting *Gevyn Constr. Corp. v. United States*, 827 F.2d 752, 754 (Fed. Cir. 1987)). The facts in this case are directly reversed from those in *Wickham* because here the government was contracted to provide a service to a private party rather than the private party rendering a service to the government. Conceptually, however, the case at hand is not distinguishable from *Wickham*. In both instances, the government breached, leaving the non-breaching party to mitigate damages.

To recover under *Wickham*, a contractor must show that "borrowed funds were used in connection with the . . . project." *Wickham*, 12 F.3d at 1583. The government contends that the AFUDC allocated to the dry storage projects should be non-compensable because TVA's debt is "general" debt; *i.e.*, TVA does not issue debt to raise proceeds for any specific capital project.

See Tr. 705:18 to 706:4 (Test. of Holmes); Def.'s Initial Post-Trial Br. at 44; AFUDC Stip. ¶ 7. In effect, the government argues that because TVA cannot point to a specific debt instrument as the source for the funds used in the dry storage construction projects, TVA does not satisfy the standards set forth in *Wickham* for inclusion of AFUDC as damages. *See* Def.'s Initial Post-Trial Br. at 43-44. TVA does not operate in a manner that allows a "one-to-one" correspondence between specific debt instruments and a specific capital project; TVA issues new short- and long-term debt on a regular basis. AFUDC Stip. ¶¶ 11-12. However, TVA is not required to meet a standard as stringent as the one the government postulates. The rule of *Wickham* and *Gevyn Construction* was designed to bar "interest" on equity as forbidden by 28 U.S.C. § 2516(a). *See Wickham*, 12 F.3d at 1582 (citing *Gevyn Constr.*, 827 F.2d at 754). TVA has satisfied that criterion as shown by its capital structure and its use of a widely-accepted, FERC-mandated standard for calculating the cost of the funds used in building the dry storage facilities. Thus, the government's contention that *Wickham* and *Gevyn Construction* should be extended by requiring a match between capital expenditures and specific debt instruments is rejected.

Alternatively, the government implies that TVA would have accrued the same amount of debt regardless of whether or not TVA had been required to build the dry storage facilities, and therefore that TVA is unable to show any causal connection between its debt and the dry storage construction projects. *See* Def.'s Initial Post-Trial Br. at 44. However, capital is not costless. *See LaSalle Talman Bank, F.S.B. v. United States*, 317 F.3d 1363, 1374-75 (Fed. Cir. 2003). Building the dry storage facilities required that TVA muster the financial resources to do so. The AFUDC represents the costs TVA incurred in so doing. The record is bereft of any evidence that TVA had sufficient financial resources derived from its cash flow to fund the tens of millions of dollars that were required for the dry storage facilities. Thus, the court allows TVA to recover its AFUDC costs.

5. *Other overhead.*

The government challenges "capital support" overhead expenses in the amount of $99,484. These costs consist of TVA management allocations. Pl.'s Initial Post-Trial Br. at 30. TVA has provided no evidence to show the utility of these costs to the project. The court accordingly disallows these claimed costs.

The government also challenges miscellaneous expenses in the amount of $2,318. These costs are said to consist of information-technology expenses, printing and equipment charges, and the like. Pl.'s Initial Post-Trial Br. at 30. Because there is no evidence respecting these charges except for their inclusion in TVA's ledger system, the court disallows recovery.

6. *The government's claimed credit.*

The government avers that TVA's damages should be reduced to account for certain "savings" that accrued to TVA as a result of DOE's breach. Specifically, the government claims that in the non-breach, but-for world, TVA would have had to incur costs in loading casks with SNF for delivery to DOE. As a result of DOE's breach, the government claims that TVA has temporarily avoided these costs, that TVA has received a benefit as a result, and that the government should be credited with an offset to TVA's damages to reflect this benefit. *See* Def.'s Initial Post-Trial Br. at 48-50; Tr. 1854:17 to 1872:10 (Test. of Brewer), 2285:1-14, 2291:15-25, 2362:25 to 2363:15 (Test. of Hartman).

The alleged benefit stems purely from timing; both DOE and TVA contemplate that DOE will still perform under the contract at some future date. *See supra*, at 2 & n.1. As matters now stand, any benefit inhering in TVA because of delayed loading costs would be entirely speculative. It is not possible to ascertain the method DOE will ultimately use for SNF acceptance. The size and type of casks to be used to transport the SNF are not known; no casks have been approved for the purpose. The mode of transport has not been determined. Additionally, the date at which DOE will begin to perform in the future cannot even be estimated, let alone determined with reasonable certainty.

In *Indiana Michigan*, the Federal Circuit expressly limited recoverable damages to those that can be "shown with reasonable certainty." 422 F.3d at 1373 (citing *Energy Capital*, 302 F.3d at 1320). "While the amount of damages need not be 'ascertainable with absolute exactness or mathematical precision[,]' recovery for speculative damages is precluded." *Indiana Mich.*, 422 F.3d at 1373 (quoting *San Carlos Irrigation*, 111 F.3d at 1563). Correlatively, the "benefits" the government seeks to setoff are too speculative to meet the standards set forth by the Federal Circuit in *Indiana Michigan*, and thus a setoff is denied.

7. *Synopsis.*

Based upon the proofs of damages adduced by the parties, the court finds that TVA has established that it is entitled to recover $35,683,438, minus $25,000 in disallowed costs of a study performed for the Browns Ferry project, $663,429 in disallowed charge-backs for use of salaried staff at Sequoyah and Browns Ferry, $99,484 in disallowed "capital support overhead expenses," and $2,318 in disallowed miscellaneous expenses. The total award of damages to TVA is thus $34,893,207.

CONCLUSION

For the reasons stated, TVA is awarded damages in the amount of $34,893,207. The clerk shall enter final judgment in favor of plaintiff for that amount. No costs.

In accord with *Restatement (Second) of Judgments* § 26(1)(b) and (e), TVA shall retain the right to bring subsequent actions on claims for damages incurred after September 30, 2004.

It is so ORDERED.

s/ Charles F. Lettow
Charles F. Lettow
Judge