**Entergy Nuclear Operations, Inc.**
Vermont Yankee
320 Governor Hunt Rd.
Vernon, VT 05354
802-257-7711

**A. Christopher Bakken III**
President and Chief Executive Officer

10 CFR 50.80
10 CFR 50.90
10 CFR 72.50

BVY 17-043

December 4, 2017

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Response to Request for Additional Information Regarding the Request for Direct and Indirect License Transfers from Entergy to NorthStar (EPID No. L-2017-LLM-0002)
Vermont Yankee Nuclear Power Station
License No. DPR-28
Docket Nos. 50-271 and 72-59

REFERENCES:

1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Application for Order Consenting to Direct and Indirect Transfers of Control of Licenses and Approving Conforming License Amendment and Notification of Amendment to Decommissioning Trust Agreement," BVY-17 005, dated February 9, 2017 (ML17045A140)

2. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Supplemental Information Regarding Application for Order Consenting to Direct and Indirect Transfers of Control of Licenses and Approving Conforming License Amendment and Notification of Amendment to Decommissioning Trust Agreement," BVY 17-027, dated August 22, 2017 (ML17234A141)

3. Letter, USNRC to Entergy Nuclear Operations, Inc., " Vermont Yankee Nuclear Power Station - Request for Additional Information Regarding the Request for Direct and Indirect License Transfers from Entergy to NorthStar (EPID No. L-2017-LLM-0002)," NVY 17-024, dated November 3, 2017 (ML17313A431)

Dear Sir or Madam:

By letter dated February 9, 2017, Entergy Nuclear Operations, Inc. (ENOI), Entergy Nuclear Vermont Yankee, LLC (ENVY), NorthStar Vermont Yankee, LLC (NorthStar VY), and NorthStar Nuclear Decommissioning Company, LLC (NorthStar NDC) (together, Applicants) submitted an application for direct and indirect license transfers for Vermont Yankee Nuclear Power Station (VY) from ENOI and ENVY to NorthStar NDC and NorthStar VY (Reference 1). Specifically the Applicants requested written consent to transfer the Vermont Yankee Renewed

Facility Operating License No. DPR-28 and the generally licensed Independent Spent Fuel Storage Installation to the named entities, as supplemented by Reference 2.

In Reference 3, the U.S. Nuclear Regulatory Commission (NRC) provided ENO with a request for additional information (RAI). This submittal provides the response to the request for additional information and supplements Reference 1 as described in the attachment.

This letter contains no new regulatory commitments.

In the event that the NRC has any questions about the transactions described in this letter or wishes to obtain any additional information, please contact Coley Chappell of Entergy at 802-451-3374, or contact Greg DiCarlo of NorthStar Group Services, Inc. at 203-222-0584 x3051 or GDiCarlo@ NorthStar.com.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 4, 2017.

Sincerely,

ACB/ccc

Attachment: 1. Response to Request for Additional Information

cc: Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
2100 Renaissance Blvd, Suite 100
King of Prussia, PA 19406-2713

Mr. Jack D. Parrott, Sr. Project Manager
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T-8F5
Washington, DC 20555

Ms. June Tierney, Commissioner
Vermont Department of Public Service
112 State Street – Drawer 20
Montpelier, Vermont 05602-2601

## AFFIRMATION

I am Chief Executive Officer, NorthStar Group Services, Inc. and, as such, I am familiar with the contents of this correspondence and the attachments thereto concerning the Vermont Yankee Nuclear Power Station, and the matters set forth therein regarding NorthStar Group Services, Inc. and its affiliated companies are true and correct to the best of my knowledge, information and belief.

I declare under penalty of perjury that the foregoing is true and correct:

Executed on December 4, 2017.

Scott E. State

Attachment 1

Vermont Yankee Nuclear Power Station

Response to Request for Additional Information

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING THE DIRECT AND INDIRECT LICENSE TRANSFER REQUEST FOR VERMONT YANKEE NUCLEAR POWER STATION

## Background

By letter dated February 9, 2017 (ML17045A140), the Applicants submitted a request for the direct and indirect license transfer of VY from ENOI and ENVY to NorthStar NDC and NorthStar VY. Specifically, the Applicants requested written consent to transfer the Vermont Yankee Renewed Facility Operating License No. DPR-28 and the generally licensed VY Independent Spent Fuel Storage Installation (ISFSI) in accordance with Section 184 of the Atomic Energy Act, and Title 10 of the Code of Federal Regulations (CFR), sections 10 CFR 50.80 and 10 CFR 72.50.

NRC regulations at 10 CFR 50.80 require the Commission's written consent for transfer of an operating license under Part 50 of the same chapter. Specifically, 10 CFR 50.80(c) states, in part, that "the Commission will approve an application for the transfer of a license, if the Commission determines: (1) That the proposed transferee is qualified to be the holder of the license; and (2) That the transfer of the license is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto."

The NRC has requested that the Applicants respond to the following Requests for Additional Information, and the responses that follow are provided by and submitted of behalf of NorthStar NDC and NorthStar VY.

## Requests for Additional Information:

## Financial RAIs

The NRC staff is continuing to review the Applicants' submittal. To verify that there is adequate funding for the decommissioning of VY, spent fuel management, and ISFSI decommissioning, the NRC staff has the following requests for information:

### RAI – 1:

On page 4 of the application, the Applicants stated, in part:

> ...The NDT will also provide up to $20 million in revolving funds for the spent fuel management costs necessary to maintain the ISFSI, subject to replenishment from recovery of claims under the Standard Contract, consistent with the requirements of 10 CFR 50.54(bb) and 50.82(a)(8)(vii).

The requirements of 10 CFR 50.82(a)(8)(i)(A) restrict the use of decommissioning trust funds to withdrawals for expenses for legitimate decommissioning activities consistent with the definition of decommissioning in 10 CFR 50.2. This definition does not include activities associated with spent fuel management. Therefore, an exemption from 10 CFR 50.82(a)(8)(i)(A) would be needed to use funds from the decommissioning trust fund for spent fuel management.

On June 23, 2015, the NRC issued an exemption to ENOI that, among other things, permitted ENOI to make withdrawals from the nuclear decommissioning trust (NDT) fund for spent fuel

management in accordance with ENOI's Irradiated Fuel Management Plan and Post Shutdown Decommissioning Activities Report (PSDAR) (80 FR 35992).

Please state whether the Applicants intend to apply for an exemption from 10 CFR 50.82(a)(8)(1)(A), or provide the rationale for why the Applicants believe that the exemption issued to ENOI to use decommissioning trust funds for spent fuel management in accordance with ENOI's Irradiated Fuel Management Plan and PSDAR would also apply to NorthStar VY upon transfer of the VY license, including applicability of the rationale that supports ENOI's exemption.

Also, it is unclear whether the potential recovery of claims against the U.S. Department of Energy under the Standard Contract constitutes a reliable source of funds. Please provide the rationale as to why the Applicants believe that if NorthStar VY uses the NDT fund for non-radiological decommissioning costs, such as spent fuel management, that these funds will be replenished.

**Response:**

**Exemption for Use of Funds:**

NorthStar NDC and NorthStar VY do not intend to apply for an exemption from 10 CFR 50.82(a)(8)1)(A) unless the NRC staff determines that a new exemption request is required. If the NRC staff so determines, an exemption request can be submitted and reviewed separate and apart from the license transfer application.

As is typical in license transfers, upon completing the transfers, NorthStar NDC and NorthStar VY plan to assume the regulatory rights and obligations of ENOI and ENVY, including exemptions, regulatory commitments, responsibility for any pending amendments, and responsibility for any other requests pending before NRC. This is discussed in Section 7.f of the LTA. As such, NorthStar NDC and NorthStar VY believe that the exemption granted to ENOI/ENVY regarding the use of trust funds for spent fuel management will continue to apply. Acknowledging that there will be changed circumstances or assumptions, the NRC staff will need to verify that the existing exemption remains valid in light of the expected changes.

Obviously, a material change in circumstance and assumption from the analysis upon which the original exemption was based is that NorthStar NDC and NorthStar VY intend to accelerate decommissioning using a planned prompt DECON approach, rather than planning for an extended period of SAFSTOR. In addition, another changed circumstance is that NorthStar NDC and NorthStar VY only intend to use up to a maximum of $20 million in NDT funds for spent fuel management at any one time. If necessary, this commitment can be made binding through a condition to an Order approving the proposed license transfers.

NorthStar NDC and NorthStar VY have demonstrated that if the use of NDT funds is limited to no more than $20 million at any one time, the remaining available funds are adequate (with earnings as allowed by NRC's regulation) to satisfy the prepayment method of decommissioning funding assurance for the decommissioning of both VY and, eventually, the VY ISFSI, in accordance with 10 CFR 50.75(e)(1)(i) and 72.30(e)(1). NRC's license transfer review will necessarily validate this demonstration, and as such, the validation of decommissioning funding assurance to be made in the license transfer review (setting aside $20 million that is earmarked for spent fuel management) will necessarily re-validate the exemption.

**Reliance Upon Recoveries of Damages from DOE:**

NorthStar believes that there is a reliable source of funds to be recovered from the United States Department of Energy (DOE) based upon ENVY/NorthStar VY's entitlement to receive monetary damages resulting from DOE's ongoing breach of the Standard Contract for Disposal of Spent Nuclear Fuel, No. DE-CR01-3NE44431, applicable to the spent fuel in the VY ISFSI. Therefore, it is reasonable and appropriate for the NRC staff to consider the planned recovery of funds from DOE as a reliable means to replenish the $20 million in revolving funds allocated from the NDT that NorthStar has earmarked to pay the upfront costs for spent fuel management pending recovery from DOE.

At the outset, it should be emphasized that NorthStar is only proposing use of the $20 million in revolving funds from the NDT and replenishment from DOE recovery for ISFSI maintenance costs. As discussed on page 5-6 of the License Transfer Application, funding for the construction of the second ISFSI pad and transfer of the remaining fuel in the spent fuel pool to the ISFSI (collectively, "the Dry Fuel Storage Project") is being provided by the Entergy credit facility. The Dry Fuel Storage Project costs will be the subject of ENVY's "Round 3" claim against DOE. NorthStar VY will enter into a promissory note agreeing to repay an Entergy affiliate the amounts advanced for this work upon recovery from DOE, but if DOE recovery is not sufficient to pay off the promissory note, any balance due will be due only after completion of the decommissioning and release of all portions of the site other than the ISFSI. NorthStar is not relying on the recovery of the Round 3 Dry Fuel Storage Project costs from DOE as part of its spent fuel management funding plan; it is only relying on the recovery of the "Round 4" and later DOE claims, which are expected to involve claims for only ISFSI maintenance costs.

***Background***

When the DOE first breached its obligations under the Standard Contract by failing to begin picking up spent fuel on January 1, 1998, the government asserted many defenses to the claims filed by utilities. A number of issues regarding the type and nature of recoverable damages were litigated and resolved upon appeal in numerous cases over the course of the following decade. As a result, key issues subject to litigation have been resolved, and in recent years, recoveries for damages have been routine.

In December 2016, the DOE's office of the Inspector General issued its Audit Report, OAI-FS-17-04, which includes an Annual Financial Report for the DOE's Nuclear Waste Fund for the fiscal years ended September 30, 2016 and 2015. (A copy of this Audit Report is provided as Appendix A.) These financial statements include an independent Auditor's Report by KPMG LLP dated November 15, 2016. Note "(9)" (pages 21-22) in the financial statements describes the spent nuclear fuel litigation. This note indicates that as of September 30, 2016, the Judgment Fund, 31 U.S.C. 1304, had paid out $4.4 billion for damages in settlements of 38 suits by utilities representing approximately 83 percent of the nuclear-generated electricity in the United States, and another $1.7 billion in damages for judgments in 41 cases. It also indicates additional unappealable judgments for which $161.5 million in payments were planned for 2017. Eight of forty-one cases resulted in no award for damages, but of these four were dismissed because claims were assigned to another party. *See* November 6, 2012 DOE Memorandum (page 14) (a copy is provided as Appendix B). As to the eleven cases that remained pending, the Financial Statements indicate: "Liability is probable." In fact, the Financial Statements book a remaining liability of "approximately $24.7 billion." Of the judgments against DOE to date, ENVY obtained one for approximately $46.5 million that was paid in 2013 and another for approximately $19.1 million that was paid in 2016.

The payments made by the government to the nuclear industry in 2015 and 2016 totaled approximately $833 million and approximately $796.2 million, respectively. These payments are reflected in the "Statement of Changes to Net Position" (page 12) under the line item "Imputed Financing from Costs Absorbed by Others." This is explained under "Imputed Financing Sources" in Note "(2)" (page 16), which notes that "settlements and judgments are Paid by the U.S. Treasury Judgment Fund." It is noteworthy that, once a judgment is obtained and unappealable, payments from the Judgment Fund, a permanent indefinite appropriation available to pay final money judgments and awards against the United States, are relatively prompt. *See, e.g.,* Judgment Fund FAQs, at https://www.fiscal.treasury.gov/fsservices/gov/pmt/jdgFund/questions.htm (indicating usually "four weeks" in response to "How long does it take to receive payment?").

The government has acknowledged the diminished uncertainty as to the outcome of litigation against DOE regarding the Standard Contract. For example, the Financial Statements explain in note "(9)" (page 22):

> The Department previously reported several developments that made it difficult to reasonably predict the amount of the Government's likely liability. The courts have since resolved that jurisdiction for these cases is appropriate in the Court of Federal Claims and that the Government cannot assert the unavoidable delays defense, under which, if it were applicable, the Government would not be liable for any damages.

Indeed, as more and more cases have been litigated, the trial and appellate courts have now resolved nearly all of the legal issues and defenses that were at issue in the earlier spent fuel litigation. The difference in experience in recent years is perhaps illustrated by a comparison of the 2016 Audit Report with a November 6, 2012 DOE Memorandum. (A copy is provided as Appendix B.). This 2012 document indicates (page 16) that as of late 2012, "the amount paid to date under [ ] settlements and as a result of final judgments" was ~$2.6 billion. Thus, in the first 15 years of litigation, the government had paid out just ~$2.6 billion. In contrast, just 4 years later, at the end of 2016, the government had paid out another ~$3.5 billion for settlements and judgments.

***ISFSI Maintenance Costs***

It is well-established that ISFSI maintenance costs, in particular, are generally very likely to be recovered as damages, whether through settlement or litigation. Damages for breach of the Standard Contract are recoverable where: (1) the damages were reasonably foreseeable by DOE 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. *See Yankee Atomic Elec. Co. v. United States*, 125 Fed. Cl. 641, 650 (2016) (citing *Indiana Michigan Power Co. v. United States*, 422 F.3d 1369, 373 (Fed.Cir. 2005)). Courts have concluded that dry storage construction and maintenance were reasonably foreseeable to DOE in the event of the government's breach. *Yankee Atomic*, 125 Fed.Cl. at 653.

It is also well-established that utilities have incurred substantial mitigation costs in storing spent nuclear fuel that otherwise would have been stored by DOE under the contract. That is, there would have been no need for sites like VY to spend substantial sums for additional at-reactor storage had DOE performed under the Standard Contract. As such, courts find that "[t]he actual costs at issue here are storage facility operational costs incurred by each utility during the claims period . . . . As the court has previously noted, dry storage construction and maintenance were reasonably foreseeable in the event of the government's breach . . . the

rather extreme expense of maintaining spent nuclear fuel storage is entirely logical." *Yankee Atomic*, 125 Fed.Cl. at 653. Accordingly, the government has agreed in settlements to reimburse utilities for "those costs incurred by NextEra for managing and storing Spent Nuclear Fuel/High Level Waste which were foreseeable in the event of DOE's Delay, and that NextEra would not have incurred but for, and which are directly related to, DOE's Delay in performance of its acceptance obligations under the Contracts."[1] The government also often does not contest routine ISFSI operational and maintenance costs, and these costs are generally recovered. *See*, *e.g.*, *Sacramento Municipal Utility District v. United States*, 130 Fed. Cl. 735 (2017) (government objected to only $7 million of SMUD's $29 million claim, and the amount in dispute did not include ISFSI maintenance costs).

Attached as Appendix C are examples where permanently shutdown plants have recovered ISFSI maintenance costs from DOE, together with references in public documents (provided as Enclosures) that verify these recoveries. These examples provide concrete evidence of the routine recovery of ISFSI maintenance costs. Where settlements are obtained, damages are recovered annually. *See, e.g.,* Ameren's 2016 SEC Form 10-K (available at https://www.sec.gov/Archives/edgar/data/18654/000100291017000054/aee201610-k.htm ), at 114 (under its settlement, Ameren received reimbursements from DOE of $24 million, $14 million and $15 million in 2016, 2015 and 2014 respectively). In litigation, the more recent recoveries for ISFSI maintenance costs have been obtained in 2-3 years. *See, e.g., Sacramento Mun. Util. Dist. v. United States,* 130 Fed. Cl. 735, 741-742 (2017) (2017 judgment for damages through June 30, 2015).

Moreover, DOE has, through its new Standard Contracts, implicitly accepted that the government should be responsible for the long term maintenance of the spent nuclear fuel that remains at nuclear power reactor sites. In 2008, when DOE began entering into new Standard Contracts and amended terms, it provided in the amended Article I, Section 28 that DOE's "performance date" for beginning to pick up spent nuclear fuel would be ten years after the reactor's operating term (including any license renewal). Beyond that point, the amended terms provided in Article IX.C that the plant operator would receive liquidated damages that "shall be in the amount of $5 million per year (in January 1, 2008 dollars adjusted for inflation based on the Consumer Price Index), for each year until DOE completes acceptance of all [spent nuclear fuel] and/or [high level waste] from the nuclear power reactor covered by this contract." The liquidated damages clause assumes that the government's payments would begin after the spent nuclear fuel is in dry cask storage (ten or more years after plant shutdown), so that the government's payment of these liquidated damages represents an implicit acknowledgement of its liability for ISFSI maintenance costs.

Given this implicit admission and the industry's strong record of successful damages recoveries from DOE in recent years, NorthStar believes that it is both reasonable and appropriate to conclude that the recovery of claims against the DOE for ISFSI maintenance costs constitutes a reliable source of funds for purposes of the spent fuel management plan, which includes the funding plan required by 10 CFR 50.54(bb).

**RAI – 2**:

On page 4 of the application, the Applicants further stated, in part:

[1] Letter from K. Feintuch of NRC to C.R. Costanzo of Duane Arnold Energy Center, Enclosure at page 4 (March 29,2010) (Safety Evaluation of Spent Fuel Management Program relying upon recoveries from DOE) (ADAMS Accession No. ML100770505).

> ...NorthStar will provide a parental financial Support Agreement to NorthStar VY in the amount of $125 million to assure that it is able to meet its financial and regulatory obligations to maintain and decommission VY and comply with all NRC requirements until the Licenses are terminated.

Provide additional information on the calculations used to determine the adequacy of the $125 million parental financial Support Agreement to NorthStar VY for payment of spent fuel management until the Department of Energy is scheduled to take receipt of fuel in 2052. Specifically, in your discussion, include the time period by which the Support Agreement is anticipated to be executed by NorthStar VY and whether a percentage growth of those monies (annually) has been considered.

**Response:**

NorthStar has committed to provide parental financial support in the form of capital or loans to support NorthStar VY throughout the decommissioning of VY in an amount not to exceed the fixed total of $125 million. The Support Agreement would be executed at the time of license transfer, and NorthStar VY anticipates that execution of the Support Agreement will be a condition of NRC's license transfer approval.

The amount of the Support Agreement represents more than 20% of the total projected costs of decommissioning, and NorthStar currently plans to maintain this financial support throughout the period of ISFSI maintenance. As described in response to RAI-1, NorthStar VY anticipates that it will be able to enter into a settlement agreement with the DOE, which should provide for the annual recovery of ISFSI maintenance cost damages due to the government's failure to begin picking up spent nuclear fuel on January 1, 1998 as required by the Standard Contract. There may be a period of time where a settlement is unavailable due to ongoing litigation over the costs of the Dry Fuel Storage Project. Thus, the $125 million provides an additional source of available funding to cover ongoing ISFSI maintenance costs, to the extent they exceed the $20 million available from the NDT. This $125 million is projected to cover more than 15 years of ISFSI maintenance costs, which provides ample time for any litigation and appeals to be resolved.

Moreover, the $125 million Support Agreement provides an additional, contingent source of funding that is substantially larger than the up to $40 million in Entergy parental guarantees that would be available if necessary and if VY continued under its current ownership.[2] Thus, if the proposed transfers are approved, the possibility of up to $40 million in future "guarantees" from Entergy would be replaced by current access to up to $125 million in funding commitments from NorthStar.

[2] Entergy's commitments relating to providing a parent company guarantee if needed were described in section 4.2 of its December 19, 2014 Post-Shutdown Decommissioning Activities Report for Vermont Yankee and would be replaced and extinguished at closing by NorthStar's commitment to provide the $125 million Support Agreement.

**RAI – 3**:

Explain the principal characteristics of the parental financial Support Agreement provided in the application as Enclosure 6, and provide the rationale for using the parental financial Support Agreement in lieu of a parent company guarantee or some other financial assurance mechanism as a means for decommissioning financial assurance, as described in 10 CFR 50.75(e)(1)(iii).

**Response:**

The terms and conditions of the Support Agreement are substantially identical to the terms and conditions of numerous parental financial support agreements that have been offered in connection with license transfer reviews involving operating reactors.[3] Such support agreements are intended to be relied upon as providing additional assurances supporting the financial qualifications of the transferee, and they are separate and apart from decommissioning funding assurance, which must involve using one of the methods set forth in 10 CFR 50.75(e), such as a guarantee meeting the requirements of 10 CFR 50.75(e)(1)(iii).

NorthStar NDC and NorthStar VY believe that the information provided in the LTA and its enclosures establishes that they meet the requirements for providing financial assurance for decommissioning using the "prepayment" method as specified in 10 CFR 50.75(e)(1)(i), provided that use of funds for spent fuel management is limited to $20 million at any one time. Thus, the $125 million Support Agreement is intended to enhance the financial qualifications of NorthStar NDC and NorthStar VY, by establishing an additional source funds to address emerging or unexpected issues and costs that might arise during decommissioning*; i.e.,* NorthStar NDC and NorthStar VY are not relying upon the Support Agreement as a means for demonstrating decommissioning financial assurance pursuant to 10 CFR 50.75. In addition, the Support Agreement is integral to the plan required pursuant to 10 CFR 50.54(bb) to provide funding for the costs of managing spent nuclear fuel until the Secretary of Energy takes title to the spent nuclear fuel. Although it is anticipated that $20 million in revolving funds should be adequate to fund spent fuel management costs pending recovery of ISFSI maintenance costs from DOE, the $125 million Support Agreement assures that there is a legally binding mechanism through which NorthStar VY can access funding for an additional 15 years of ISFSI maintenance costs, if recovery from DOE were delayed. Unlike 10 CFR 50.75(e), 10 CFR 50.54(bb) does not prescribe the methods by which spent fuel management activities must be funded.

[3] *See, e.g.,* 70 FR 70107, 70108 (Nov. 21, 2005) (Order approving transfer of licenses with condition regarding $400 million Support Agreement); 69 FR 34197, 34198 (June 18, 2004) (Order approving of license transfer with $60 million Support Agreement).

**Technical RAIs**

The NRC staff considered the following regulations and guidance for the technical qualification evaluation: 10 CFR 50.40(b), "Common Standards"; 10 CFR 50.80, "Transfer of Licenses"; the applicable section of 10 CFR 72.50, "Transfer of License" (Section 72.50(a) for the transfer of general licenses); Standard Review Plan (SRP) NUREG-0800, Section 13.1.1, "Management and Technical Support Organization," and Sections 13.1.2 - 13.1.3, "Operating Organizations"; Regulatory Guide 1.8, Revision 3, May, 2000, Qualification and Training of Personnel for Nuclear Power Plants; and American Nuclear Society/ American National Standards Institute (ANS/ANSI) 3.1-2014, Selection, Qualification and Training of Personnel for Nuclear Power Plants.

**RAI – 4**:

More information is needed to determine the technical qualifications of the proposed transferee, as required under 10 CFR 50.40(b), 50.80(b)(1) and 50.80 (c)(1).

Further detail on both the responsibilities and experience of the senior managers identified on the organization chart in Enclosure 3 to the application (Attachment 1) is needed to determine the qualifications of the persons who will be filling those positions.

In addition to the resumes provided for the key management personnel in the application, please provide the resumes for each named person in the management positions identified in the planned NorthStar NDC organization chart in Enclosure 3 of the application, namely the QA Manager, Health & Safety Manager, ISFSI/Plant Manager, D&D Operations Manager, Remediation Manager, Waste Manager, and Compliance Engineering Manager. For those management positions without a named individual please provide a description of the position responsibilities.

Please identify the individual on the organization chart who would be considered the "Site Manager," or the onsite person who would have the ultimate responsibility for day to day operations at the site; in addition, describe the responsibilities of the manager responsible for radiological protection and the experience of that person if one has been named.

Also, Attachment 1, Section 4b, "Strategic Partner Experience and Expertise," of the application lists four university research reactors, at the Universities of Buffalo, Arizona, Illinois and Washington, as successful NorthStar decontamination and decommissioning projects. It is mentioned that NorthStar has been, or will be, involved with decommissioning at the Hanford and Savannah River sites, at several university laboratories, and at ten reactor sites in the United Kingdom. Please provide information regarding NorthStar's management and technical role in these decommissioning projects. For each project, please describe NorthStar's role as either the principal lead contractor or subcontractor and the technical services it provided at these sites.

**Response:**

Resumes for the managers identified on Enclosure 3 to the application are provided in Appendix D.

i. QA Manager (Terry Krause – Burns & McDonald)

ii. Health & Safety Manager (John Ryan)

iii. ISFSI/Plant Manager (Corey Daniels)

iv. D&D Operations Manager (Nelson Langub)

v. Remediation Manager (Scott LaBuy)

vi. Waste Manager (Matthew LaBarge – WCS), and

vii. Compliance Engineering Manager (Terry Garrett – Burns & McDonald).

viii. Director of Health Physics and Waste Operations (Daniel Jordan)

The Decommissioning Program manager, Billy Reid, will be the "Site Manager" and have ultimate responsibility for day to day operations at the site. Daniel Jordan will be the manager responsible for radiation protection (RP). A description of the ISFSI RP and Environmental Program Coordinator is also provided following Mr. Jordan's resume.

Information regarding NorthStar's role in decommissioning projects is provided in the table below:

| | D&D Planning | Reactor Disassembly | Decontamination | Systems and Components Removal | Structural Demolition | Radiological Assessments, Work Coverage, Monitoring | Radiological Waste Packaging, Transportation, Disposal | Mixed Waste Packaging, Transportation, Disposal | Clean Waste T&D | Final Status Surveys | Principal Lead Contractor | Subcontractor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| University at Buffalo D&D | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| University of Illinois TRIGA | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| University of Arizona TRIGA | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| University of Washington D&D | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Hanford 308, 309, 340 | ✓ | | | ✓ | ✓ | | ✓ | | | | | ✓ |
| Oak Ridge Y-12 National Security Complex Building 9211 and 9769 | ✓ | | | | ✓ | | ✓ | | | | ✓ | |
| Savannah River Site Cooling Towers | ✓ | | | | | | | | ✓ | | | ✓ |
| UK Magnox Sites | ✓ | | | | | | | | | | | ✓ |

Further information regarding this experience is provided in Appendix E.

**RAI – 5**:

SRP NUREG-0800, Section 13.11, "Management and Technical Support Organization," and Sections 13.1.2 - 13.1.3, "Operating Organizations," indicate that the objective of a review of license transfers under 10 CFR 50.80 is to ensure that the corporate management is involved with, informed of, and dedicated to the safe decommissioning of the plant. In addition, the review is to ensure that sufficient technical resources will be provided to adequately accomplish this objective and that there are sufficient interface arrangements and controls between the applicant and the major support organizations that the applicant will be responsible for and Oversee.

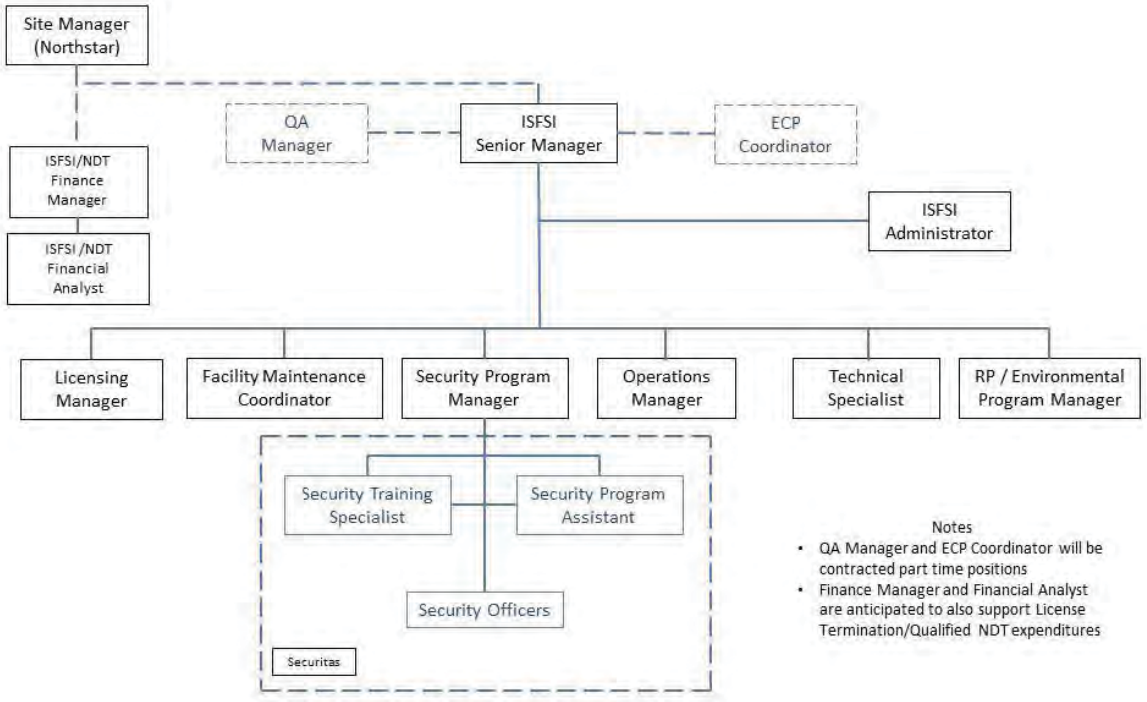
More information is needed to evaluate any proposed changes to the current technical organization as a result of the transfer and to evaluate the supporting technical resources that will be used for the decommissioning operations.

Please describe how the current Entergy organizational chart for decommissioning the VY facility will change if the application is approved by the NRC. If a function under the current organization will not be carried to the organization proposed by the Applicants, please explain why.

NorthStar NDC identified the ability to leverage the experience of its parent, NorthStar Group Services Inc., and strategic partners AREVA, Bums & McDonnell, and Waste Control Specialists, named in the application as support for performing the decommissioning, decontamination and site restoration of the VY facility. Please identify where the parent company and strategic partners fit into the planned NorthStar NDC organization chart in Enclosure 3 of the application. Also, please identify where in the organization these supporting organizations would provide support to operations at the site, and identify the lines of communication and authority these supporting organization would have in the overall organization.

**Response:**

NorthStar NDC and NorthStar VY anticipate that Entergy will transition its VY organization to be aligned with managing spent nuclear fuel in an ISFSI-only configuration by the end of 2018, upon completion of the Dry Fuel Storage Project. An organization chart reflecting the “SAFSTOR Phase 3” Entergy organization that is expected to be transitioned by Entergy upon completion of the fuel transfer to the ISFSI, modifications for the ISFSI Security Protected Area, and implementation of changes related to the transition to ISFSI status that require NRC approval, which are anticipated to be in place by the end of 2018, just prior to the proposed license transfer, is provided below:




NorthStar NDC plans to incorporate the Entergy organization into the decommissioning and decontamination execution organization reflected in Enclosure 3. Enclosure 3 shows the ISFSI/Plant Manager from the Entergy organization reporting to the NorthStar NDC Decommissioning Program Manager.

In addition to providing input through the Executive Committee reflected on Enclosure 3, NorthStar NDC expects that its strategic partners will act as contractors performing various functions under the oversight of the NorthStar NDC organization reflected in Enclosure 3. For example, AREVA will establish an organization to conduct the reactor pressure vessel segmentation, and this organization will report to and conduct its activities under the oversight of NorthStar NDC's D&D Operations Manager. The following chart provides each strategic partner's various functions:

| | | Expertise | Experience |
|---|---|---|---|
| NorthStar | **World's Largest Turnkey Decommissioning & Facility Services Contractor** | D&D*, Asbestos & Hazardous Materials Abatement, Facility Demolition | 35+ Years Specialty Contractor Services<br>95% of all projects require regulatory approvals to complete |
| AREVA | **World's Leading Nuclear Fuel & Services Provider** | Vessel & Internals Segmentation<br>Spent Fuel Support | 20+ Years Reactor D&D<br>Project Team Experience<br>- Wuergassen BWR<br>- Yankee Plants |
| BURNS McDONNELL | **Global Full-Service Engineering & Environmental Solutions Firm** | Environmental Engineering & License Transfer/ Termination Support | Founded in 1898<br>Cimarron, Tronox<br>Over 5,300 professionals |
| WCS ANDREWS, TEXAS | **Nation's Leading Radioactive & Hazardous Waste Services Provider** | Waste Management, Packaging, Transportation & Disposal | Class A, B, C & Exempt LLRW Facility<br>TX Compact & Federal Waste Disposal Facilities |

# Appendices to Attachment 1

**Appendix A** – Audit Report OAI-FS-17-04, December 2016

**Appendix B** – DOE Memorandum: Liability Estimate, November 6, 2012

**Appendix C** – Permanently Shutdown Plants Recovering ISFSI Operating Costs from DOE (including Enclosures 1 through 5 to Appendix C)

**Appendix D** – D&D Organization Resumes

**Appendix E** – Decommissioning Experience Project Profiles

(243 pages including this cover page)

# APPENDIX A

# Audit Report
# OAI-FS-17-04
# December 2016

OFFICE OF INSPECTOR GENERAL

U.S. Department of Energy

# AUDIT REPORT

OAI-FS-17-04

December 2016

# DEPARTMENT OF ENERGY NUCLEAR WASTE FUND'S FISCAL YEAR 2016 FINANCIAL STATEMENT AUDIT

**Department of Energy**
Washington, DC 20585

December 14, 2016

MEMORANDUM FOR THE DIRECTOR, OFFICE OF STANDARD CONTRACT MANAGEMENT

FROM: Rickey R. Hass
Acting Inspector General

SUBJECT: INFORMATION: Audit Report on "Department of Energy Nuclear Waste Fund's Fiscal Year 2016 Financial Statement Audit"

The attached report presents the results of the independent certified public accountants' audit of the balance sheets of the Department of Energy Nuclear Waste Fund (Fund), as of September 30, 2016 and 2015, and the related statements of net cost, changes in net position, and statements of budgetary resources for the years then ended.

To fulfill Office of Inspector General (OIG) audit responsibilities, we contracted with the independent public accounting firm of KPMG LLP (KPMG) to conduct the audit, subject to our review. KPMG is responsible for expressing an opinion on the Fund's financial statements and reporting on applicable internal controls and compliance with laws and regulations. The OIG monitored audit progress and reviewed the audit report and related documentation. This review disclosed no instances where KPMG did not comply, in all material respects, with generally accepted Government auditing standards. The OIG did not express an independent opinion on the Fund's financial statements.

KPMG concluded that the combined financial statements present fairly, in all material respects, the respective financial position of the Fund as of September 30, 2016 and 2015, and its net costs, changes in net position, and budgetary resources for the years then ended, in conformity with United States generally accepted accounting principles.

As part of this review, auditors also considered the Fund's internal controls over financial reporting and tested for compliance with certain provisions of laws, regulations, contracts, and grant agreements that could have a direct and material effect on the determination of financial statement amounts. The results of the auditors' review disclosed no instances of noncompliance or other matters required to be reported under generally accepted Government auditing standards or applicable Office of Management and Budget guidance.

Attachment

cc: Chief Financial Officer, CF-1
Deputy Chief Financial Officer, CF-2

# UNITED STATES DEPARTMENT OF ENERGY
# NUCLEAR WASTE FUND

## Annual Financial Report

## As of and for the Years Ended
## September 30, 2016 and 2015

**November 15, 2016**

**UNITED STATES DEPARTMENT OF ENERGY**
**NUCLEAR WASTE FUND**

Annual Financial Report
September 30, 2016 and September 30, 2015

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## Management's Discussion & Analysis

### Reporting Entity

The Nuclear Waste Policy Act of 1982 (NWPA) (Public Law 97-425) established the Office of Civilian Radioactive Waste Management (OCRWM) within the United States (U.S.) Department of Energy (Department or DOE). OCRWM's mission was to manage and dispose of the Nation's spent nuclear fuel (SNF) and high-level radioactive waste (HLW). The Nuclear Waste Policy Amendments Act of 1987 (Title V, Public Law 100-203) directed the Secretary of Energy to characterize only the Yucca Mountain site in Nevada as a candidate site to determine if it was suitable for a repository for SNF and HLW.

The characterization of the Yucca Mountain site was completed and in 2008 OCRWM submitted a license application to the U.S. Nuclear Regulatory Commission (NRC or the Commission) seeking authorization to construct the Yucca Mountain repository. In fiscal year (FY) 2009, the Obama Administration decided to terminate the Yucca Mountain Project. On January 29, 2010, at the direction of the President, the Secretary announced the formation of the Blue Ribbon Commission (BRC) and on February 1, 2010, the President issued the FY 2011 Budget Request with a zero budget request for OCRWM. On March 3, 2010 the Department filed a motion to withdraw with prejudice the Yucca Mountain License Application pending before the Atomic Safety and License Board (ASLB or Board) of the NRC. On June 29, 2010, the ASLB issued an order denying the Department's motion to withdraw the License Application, which the Department appealed to the NRC, the body with final authority over NRC decision-making. On October 1, 2010 the Department shifted OCRWM program responsibilities to various Departmental Program Secretarial Offices.

On July 29, 2011, a lawsuit was filed against the NRC in the U.S. Court of Appeals for the District of Columbia Circuit requesting a writ of mandamus ordering the NRC to continue reviewing the Yucca Mountain license application.

On September 9, 2011, the NRC issued its decision in which the Commission (1) announced it was split evenly on the question whether the NRC's ASLB had properly refused to allow the Department's motion to withdraw the Yucca Mountain construction license application with prejudice, and (2) unanimously held that "budgetary limitations" required the ASLB to dispose of pending matters by the end of FY 2011 and to document the history of the adjudicatory process. On September 30, 2011, the Board issued a memorandum and order suspending the adjudicatory portion of the licensing proceeding due to uncertainty regarding the availability of future appropriations from the NWF to pay for future proceeding and a lack of staff to continue the proceeding since the President's FY 2012 budget request for Yucca Mountain high-level waste activities did not include a request for any full-time equivalent positions. The adjudicatory portion of the licensing proceeding remains suspended.

The BRC submitted a final report in January 2012 with its recommendations for consideration by the Administration and Congress, as well as interested state, tribal and local governments, other stakeholders, and the public.

On August 13, 2013, the U.S. Court of Appeals for the District of Columbia Circuit issued a writ of mandamus to the NRC to promptly continue with the legally mandated licensing proceeding unless and until Congress authoritatively says otherwise or there are no appropriated funds remaining.

On November 18, 2013 the NRC requested the Department of Energy to prepare the supplemental environmental impact statement (EIS) that the NRC staff determined was needed for purposes of the review of the application under the National Environmental Policy Act (NEPA). On February 28, 2014 the Department wrote to the NRC that it would provide to the NRC an updated version of the report it provided to the NRC on July 30, 2009, entitled, *Analysis of Postclosure Groundwater Impacts for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada*. The updated report was provided by the DOE to the NRC on October 3, 2014. The analysis provides the NRC with substantially all of the technical information necessary to inform a draft EIS.

No funds for Yucca Mountain were requested in the FY 2016 or FY 2015 Budget Requests. Funds remaining from OCRWM have been used between October 1, 2010 and September 30, 2016 to continue the management of the Nuclear Waste Fund (NWF), litigation activities, and for additional closure activities. The funds are managed by the Office of Nuclear Energy.

**Fiscal Year 2016 and 2015 Financial Performance**

The principal financial statements have been prepared to report the financial position and results of operations of the entity, pursuant to the requirements of 31 United States Code 3515 (b). While the statements have been prepared from the books and records of the entity in accordance with Generally Accepted Accounting Principles for Federal entities and the formats prescribed by Office of Management of Budget (OMB), the statements are in addition to the financial reports used to monitor and control budgetary resources, which are prepared from the same books and records. The statements should be read with the realization that they are for a component of the U.S. Government, a sovereign entity.

The NWF consists of fees paid by the owners and generators of SNF from commercial reactors, in accordance with provisions of their contracts with the Department for disposal services. NWF assets in excess of those authorized by Congress to pay Nuclear Waste Policy Act costs are invested in U.S. Treasury securities. On November 19, 2013, the U.S. Court of Appeals for the District of Columbia Circuit found that the Department did not have a legitimate basis to evaluate the ongoing fee and directed the Department to propose to Congress a reduction of the ongoing fee to zero. The Department complied and such proposal became effective on May 16, 2014. The Nuclear Waste Policy Act originally provided that the federal government would pay the costs of defense-generated nuclear waste directly into the Nuclear Waste Fund. However, Congress in 1993 changed that requirement to instead establish a separate Defense Nuclear Waste Disposal appropriation (DNWDA). As of September 30, 2016, cumulative billings from fees and the DNWDA, totaled approximately $25.4 billion; and cumulative interest earnings and other revenue totaled approximately $24.8 billion. As of September 30, 2016, cumulative expenditures by the Department from appropriations and amounts authorized by Congress, including direct appropriations to the NRC, the now defunct Office of the Nuclear Waste Negotiator, and the Nuclear Waste Technical Review Board, totaled approximately $11.4 billion.

As of September 30, 2016, the U.S. Treasury securities held by the Department related to the NWF had a fair value of $46.0 billion compared to $42.4 billion at the end of fiscal year FY 2015. Investment income and net gains from the maturity of securities totaled $1.4 billion for FY 2016 and FY 2015, respectively.

## ANALYSIS OF SYSTEMS, CONTROLS, AND LEGAL COMPLIANCE

Analysis of systems, controls, and legal compliance is performed, reported, and audited at the Departmental level. The results of these reviews and assessments are incorporated in the Department's Annual Financial Report. A significant issue, Used Fuel and High Level Waste Disposal, was reported by management in FY 2016 and FY 2015 and is described below.

### Federal Managers' Financial Integrity Act

The Federal Managers' Financial Integrity Act (FMFIA) of 1982 requires that agencies establish internal control and financial systems to provide reasonable assurances that the integrity of Federal programs and operations are protected. Furthermore, it requires that the head of the agency provide an annual assurance statement on whether the agency has met this requirement and whether any material weaknesses exist.

In response to the FMFIA, the Department developed an internal control program which holds managers accountable for the performance, productivity, operations, and integrity of their programs through the use of management controls. Annually, senior managers at the Department are responsible for evaluating the adequacy of the internal controls surrounding their activities and determining whether they conform to the principles and standards established by the Office of Management and Budget, and the Government Accountability Office. The results of these evaluations and other senior management information are used to determine whether there are any internal control problems to be reported as material weaknesses. The Departmental Internal Control and Audit Review Council, the organization responsible for oversight of the Management Control Program, makes the final assessment and decision for the Department.

### Significant Issue - USED FUEL AND HIGH LEVEL WASTE DISPOSAL

The government's acceptance of spent nuclear fuel and high-level radioactive waste, authorized under the NWPA, has been delayed by various factors.

### Actions Taken and Remaining

The Secretary, acting at the direction of the President, established the BRC on America's Nuclear Future to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle, including all alternatives for the storage, processing, and disposal of civilian and defense used nuclear fuel, high-level waste, and materials derived from nuclear activities. The BRC submitted a final report in January 2012 with their recommendations for consideration by the Administration and Congress. The Administration issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Waste" on January 11, 2013 (Strategy), which is primarily based on the BRC's recommendation, but no Congressional action has been taken to date to fully implement the Strategy. The key assumptions from the Strategy are: that (1) a pilot storage facility will be operational in 2021 to allow for the removal of SNF from shut down reactors; (2) an interim storage facility will be operational in 2025 to begin the removal of SNF

from operating nuclear power reactors and (3) that reactors will incur costs reimbursable by the Department until the Department has fulfilled its obligations under the agreements. The Department continues to perform research and development, analytical, and planning activities that lay the groundwork for implementing the Strategy.

**KPMG LLP**
Suite 12000
1801 K Street, NW
Washington, DC 20006

# Independent Auditors' Report

United States Department of Energy Acting Inspector General
United States Department of Energy's Nuclear Waste Fund:

## Report on the Financial Statements

We have audited the accompanying financial statements of the United States (U.S.) Department of Energy's (Department) Nuclear Waste Fund (Fund), which comprise the balance sheets as of September 30, 2016 and 2015, and the related statements of net cost, changes in net position, and budgetary resources for the years then ended, and the related notes to the financial statements.

### *Management's Responsibility for the Financial Statements*

Management is responsible for the preparation and fair presentation of these financial statements in accordance with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### *Auditors' Responsibility*

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America, in accordance with the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, and in accordance with Office of Management and Budget (OMB) Bulletin No. 15-02, *Audit Requirements for Federal Financial Statements*. Those standards and OMB Bulletin No. 15-02 require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### *Opinion on the Financial Statements*

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Fund as of September 30, 2016 and 2015, and its net costs, changes in net position, and budgetary resources for the years then ended in accordance with U.S. generally accepted accounting principles.

KPMG LLP is a Delaware limited liability partnership, the U.S. member firm of KPMG International Cooperative ("KPMG International"), a Swiss entity.

***Emphasis of Matter***

As discussed in Note 9 to the financial statements, the Department is involved as a defendant in several matters of litigation relating to its inability to accept waste by the January 31, 1998 date specified in the Nuclear Waste Policy Act of 1982, as amended. The Fund has recorded an estimate of its liability related to this matter of $24.7 billion, and $23.7 billion as of September 30, 2016 and 2015, respectively. Our opinion is not modified with respect to this matter.

***Other Matters***

*Required Supplementary Information*

U.S. generally accepted accounting principles require that the information in the Management's Discussion & Analysis section be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Federal Accounting Standards Advisory Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audits of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

*Other Information*

Our audits were conducted for the purpose of forming an opinion on the basic financial statements as a whole. The Other Information – Schedules I and II – is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has not been subjected to the auditing procedures applied in the audits of the basic financial statements, and accordingly, we do not express an opinion or provide any assurance on it.

**Other Reporting Required by *Government Auditing Standards***

***Internal Control Over Financial Reporting***

In planning and performing our audit of the financial statements as of and for the year ended September 30, 2016, we considered the Fund's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Fund's internal control. Accordingly, we do not express an opinion on the effectiveness of the Fund's internal control. We did not test all internal controls relevant to operating objectives as broadly defined by the *Federal Managers' Financial Integrity Act of 1982*.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected, on a timely basis. A

significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

***Compliance and Other Matters***

As part of obtaining reasonable assurance about whether the Fund's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests of compliance disclosed no instances of noncompliance or other matters that are required to be reported herein under *Government Auditing Standards* or OMB Bulletin No. 15-02.

***Purpose of the Other Reporting Required by* Government Auditing Standards**

The purpose of the communication described in the Other Reporting Required by *Government Auditing Standards* section is solely to describe the scope of our testing of internal control and compliance and the result of that testing, and not to provide an opinion on the effectiveness of the Fund's internal control or compliance. Accordingly, this communication is not suitable for any other purpose.

KPMG LLP

Washington, DC
November 15, 2016

**UNITED STATES DEPARTMENT OF ENERGY**

**NUCLEAR WASTE FUND**

**Balance Sheets**
**As of September 30, 2016 and 2015**
**(Dollars in thousands)**

| | FY 2016 | FY 2015 |
|---|---|---|
| **ASSETS** | | |
| Intragovernmental: | | |
| Fund Balance with Treasury (Note 3) | $ 15,644 | $ 23,038 |
| Investments and Related Interest, Net (Note 4) | 36,027,301 | 34,295,100 |
| Total Intragovernmental Assets | 36,042,945 | 34,318,138 |
| Accounts Receivable: | | |
| Utilities (Note 5) | 2,788,593 | 3,084,822 |
| Prepaid Pension Asset, Net | - | 99 |
| General Property, Plant, and Equipment, Net (Note 6) | 132 | 182 |
| Total Assets | $ 38,831,670 | $ 37,403,241 |
| **LIABILITIES** | | |
| Intragovernmental: (Note 8) | | |
| Accounts Payable | $ 1 | $ 95 |
| Deferred Revenue (Notes 7 and 10) | 633,944 | 633,490 |
| Other Liabilities | 197 | 197 |
| Total Intragovernmental Liabilities | 634,142 | 633,782 |
| Accounts Payable and Other Liabilities | 794 | 190 |
| Deferred Revenue (Note 10) | 38,182,583 | 36,752,793 |
| Commitments and Contingencies (Note 9) | 24,689,260 | 23,699,690 |
| Total Liabilities (Note 8) | 63,506,779 | 61,086,455 |
| **NET POSITION** | | |
| Unexpended Appropriations - Other Funds | 14,151 | 16,476 |
| Cumulative Results of Operations - Other Funds | (24,689,260) | (23,699,690) |
| Total Net Position | (24,675,109) | (23,683,214) |
| Total Liabilities and Net Position | $ 38,831,670 | $ 37,403,241 |

***The accompanying notes are an integral part of these statements.***

**UNITED STATES DEPARTMENT OF ENERGY**

**NUCLEAR WASTE FUND**

**Statements of Net Cost**

**For the Years Ended September 30, 2016 and 2015**

**(Dollars in thousands)**

| | FY 2016 | FY 2015 |
|---|---|---|
| First Repository Costs | $ 3,117 | $ 974 |
| All Other Program Costs: | | |
| Program Support | 747 | 1,413 |
| Transfers of Appropriations (Note 7) | 3,600 | 3,400 |
| Waste Acceptance, Storage and Transportation | 1,369 | 1,919 |
| Total All Other Program Costs | 5,716 | 6,732 |
| Total First Repository and Other Program Costs | 8,833 | 7,706 |
| Less Earned Revenues (Note 10) | (8,833) | (7,706) |
| Net First Repository Costs & Other Program Costs | - | - |
| Estimated costs for waste acceptance obligations | 1,785,763 | 1,898,995 |
| Net Cost of Operations | $ 1,785,763 | $ 1,898,995 |

***The accompanying notes are an integral part of these statements.***

**UNITED STATES DEPARTMENT OF ENERGY**

**NUCLEAR WASTE FUND**

**Statements of Changes in Net Position**
**For the Years Ended September 30, 2016 and 2015**
**(Dollars in thousands)**

| | FY 2016 | FY 2015 |
|---|---|---|
| **CUMULATIVE RESULTS OF OPERATIONS** | | |
| Beginning Balance | $ (23,699,690) | $ (22,633,674) |
| Other Financing Sources (Non-Exchange): | | |
| Imputed Financing from Costs Absorbed by Others | 796,193 | 832,979 |
| Total Other Financing Sources | 796,193 | 832,979 |
| Net Cost of Operations | (1,785,763) | (1,898,995) |
| Net Change | (989,570) | (1,066,016) |
| Ending Balance - Cumulative Results of Operations | $ (24,689,260) | $ (23,699,690) |
| **UNEXPENDED APPROPRIATIONS** | | |
| Beginning Balance | $ 16,476 | $ 19,049 |
| Budgetary Financing Sources Related to Appropriations: | | |
| Appropriations Used | (2,325) | (2,573) |
| Total Budgetary Financing Sources Related to Appropriations | (2,325) | (2,573) |
| Ending Balance - Unexpended Appropriations | 14,151 | 16,476 |
| Total Net Position | $ (24,675,109) | $ (23,683,214) |

***The accompanying notes are an integral part of these statements.***

**UNITED STATES DEPARTMENT OF ENERGY**

**NUCLEAR WASTE FUND**

**Statements of Budgetary Resources**
**For the Years Ended September 30, 2016 and 2015**
**(Dollars in thousands)**

| | FY 2016 | FY 2015 |
|---|---|---|
| **BUDGETARY RESOURCES** | | |
| Unobligated Balance, Brought Forward, October 1 | $ 19,003 | $ 16,234 |
| Recoveries of Unpaid Prior Year Obligations | 478 | 3,514 |
| Unobligated Balance from Prior Year Budget Authority, net | 19,481 | 19,748 |
| Appropriations (Note 2) | - | - |
| Spending Authority from Offsetting Collections | - | 280 |
| Total Budgetary Resources | $ 19,481 | $ 20,028 |
| **STATUS OF BUDGETARY RESOURCES** | | |
| New Obligations and Upward Adjustments (Note 12) | $ 977 | $ 1,025 |
| Unobligated Balance, End of Year: | | |
| Apportioned, Unexpired Accounts | 5,719 | - |
| Exempt from Apportionment, Unexpired Accounts | 12,785 | 13,290 |
| Unapportioned, Unexpired Accounts | - | 5,713 |
| Unobligated Balance, End of Year | 18,504 | 19,003 |
| Total Budgetary Resources | $ 19,481 | $ 20,028 |
| **CHANGE IN OBLIGATED BALANCE** | | |
| Unpaid Obligations, Brought Forward, October 1 | $ 17,599 | $ 24,854 |
| New Obligations and Upward Adjustments | 977 | 1,025 |
| Outlays (Gross) | (4,575) | (4,766) |
| Recoveries of Prior Year Unpaid Obligations | (478) | (3,514) |
| Obligated Balance, End of Year | $ 13,523 | $ 17,599 |
| **BUDGET AUTHORITY AND OUTLAYS, NET** | | |
| Budget Authority, Gross | $ - | $ 280 |
| Actual Offsetting Collections | - | (280) |
| Budget Authority, Net | $ - | $ - |
| Outlays, Gross | $ 4,575 | $ 4,766 |
| Actual Offsetting Collections | - | (280) |
| Distributed Offsetting Receipts | (1,734,550) | (1,429,413) |
| Outlays, Net | $ (1,729,975) | $ (1,424,927) |

***The accompanying notes are an integral part of these statements.***

# UNITED STATES DEPARTMENT OF ENERGY
# NUCLEAR WASTE FUND

Notes to Financial Statements
September 30, 2016 and September 30, 2015

(Dollars in thousands unless otherwise noted)

## (1) Legislative Background

The Nuclear Waste Policy Act of 1982 (NWPA) was signed into law on January 7, 1983. The NWPA establishes a framework for the financing, siting, licensing, operating and decommissioning of one or more mined geologic repositories for the Nation's spent nuclear fuel (SNF) and high-level radioactive waste (HLW) which is to be carried out by the Department of Energy (Department or DOE). In addition, the NWPA contains other provisions including:

- Assigning responsibility for the payment of disposal costs to the owners and generators of SNF and HLW and creating a special Nuclear Waste Fund (NWF) within the Department of Treasury of the United States for the collection of fees to cover such costs;

- Providing for contracts between the Department and the owners and generators of SNF and HLW pursuant to which the Department is to take title to the SNF or HLW as expeditiously as possible, following commencement of repository operations and, in return for payment of fees established by the NWPA, to begin disposal of the SNF or HLW not later than January 31, 1998; and

- Requiring evaluation of the use of civilian disposal capacity for the disposal of HLW resulting from atomic energy defense activities (Defense HLW). In April 1985, the President notified the Department of his determination that a separate defense waste repository was not necessary and directed the Department to proceed with arrangements for disposal of such waste. Fees, equivalent to those paid by commercial owners, must be paid for this service by the Federal Government. In March 2015, the President found that the development of a repository for the disposal of Defense HLW is required.

On December 22, 1987, the President signed into law the Budget Reconciliation Act, Subtitle A Title V, of which contained amendments to the NWPA. The legislation directed the Department to characterize only the Yucca Mountain site in Nevada as a candidate site for the first repository. The legislation also provided for the termination of site-specific activities at all candidate sites other than the Yucca Mountain site, within 90 days of enactment, and for phasing out, not later than six months after enactment, all research programs in existence that were designed to evaluate the suitability of crystalline rock as a potential repository host medium.

In fiscal year (FY) 2009, the President and the Department Secretary announced that a repository at Yucca Mountain was not a workable option and that the repository program would be terminated. At that time, they also announced that a Blue Ribbon Commission would be established to evaluate disposal alternatives. Accordingly, on January 29, 2010, the Department Secretary announced the formation of a Blue Ribbon Commission on America's Nuclear Future to provide recommendations for developing a safe, long-term solution to managing the Nation's used nuclear fuel and nuclear waste. The Blue Ribbon Commission submitted a final report in January 2012 with their recommendations on these issues for consideration by the Administration and Congress, as well as interested state, tribal and local governments, other stakeholders, and the public. On February 1, 2010, the President issued the FY 2011 Budget Request with a zero budget request for the Nuclear Waste Fund Appropriation and the Defense Nuclear Waste Disposal Appropriation (formerly known as and reported under the Office of Civilian Radioactive Waste Management (OCRWM) prior to FY 2011). Consequently, the Department closed OCRWM on September 30, 2010, and, on October 1, 2010, the Department reassigned prior responsibilities for the operations of OCRWM and its assets and liabilities within the Department, herein referred to as the NWF.

**UNITED STATES DEPARTMENT OF ENERGY**
**NUCLEAR WASTE FUND**

Notes to Financial Statements
September 30, 2016 and September 30, 2015

(Dollars in thousands unless otherwise noted)

## (2) Significant Accounting Policies

**Basis of Presentation** – These financial statements have been prepared to report the financial position and results of operations of the NWF and include all activity related to the Nuclear Waste Fund Appropriation and the Defense Nuclear Waste Disposal Appropriation, used for the disposal of SNF and HLW (formerly reported under the Office of Civilian Radioactive Waste Management). The financial statements have been prepared from the books and records of the Department for the NWF in accordance with accounting principles generally accepted in the United States of America as applicable to Federal entities.

**Basis of Accounting** – The NWF's financial statements are prepared using the accrual method of accounting. Under the accrual method, revenues are recognized when earned, and expenses are recognized when a liability is incurred without regard to receipt or payment of cash. The NWF also uses budgetary accounting to facilitate compliance with legal constraints and to monitor its budget authority.

**Revenue Recognition** – Fees, related accrued interest, and investment income are recognized as exchange (earned) revenue to the extent of expenses incurred, subject to Congressional authorization as discussed below. Fees billed, related accrued interest, and investment income in excess of current expenses are deferred.

The NWPA requires the civilian owners and generators of nuclear waste to pay their share of the full cost of the NWF and, to that end, establishes a fee for electricity generated and sold by civilian nuclear power reactors which the Department must collect and annually assess to determine its adequacy. A one-time fee (see Note 5) was recorded by the NWF as of April 7, 1983, related to the disposal of SNF generated prior to that date. Fees recognized by the NWF are based upon kWh of electricity generated and sold by civilian nuclear reactors on and after April 7, 1983.

Fees associated with the disposal of the Department's SNF and HLW are also recognized as the related costs are incurred and allocated. To estimate the share of the total Program costs that should be allocated to the Department, the methodology announced by the Department in the Federal Register in August 1987 was used. Department management periodically updates the *Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program* (TSLCC), which establishes the amounts to allocate. The most recent TSLCC was issued in 2008.

**Appropriations** – Expenditure authority for the NWF has historically been provided by two separate appropriations. For fiscal years 2016 and 2015, Congress appropriated $0 from the Defense Nuclear Waste Disposal Appropriation and the Nuclear Waste Disposal Appropriation to be used for nuclear waste disposal activities.

Fee payments and investment income are deposited into the NWF account and are made available to the Department through the annual expenditure authority provided by Congress. Investments are made in United States (U.S.) Treasury securities from funds in excess of current needs. If, at any time, monies available in the NWF are insufficient to discharge responsibilities under the NWPA, borrowings may be made from the U.S. Treasury. The NWPA limits the NWF from incurring expenditures, entering into contracts, and obligating amounts to be expended except as provided in advance by appropriation acts. Appropriated dedicated collections such as these are excluded from appropriations received on the *Statements of Changes in Net Position*.

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## (2) Significant Accounting Policies (continued)

**Imputed Financing Sources** – In certain instances, costs of the NWF are paid out of funds appropriated to other federal agencies. For example, payments under the terms of settlements and judgments are paid by the U.S. Treasury Judgment Fund (Judgment Fund). When costs directly attributable to NWF's operations are paid by other agencies, NWF recognizes these amounts in the *Statements of Net Cost*. In addition, these amounts are recognized as imputed financing sources in the *Statements of Changes in Net Position*.

**Funds from Dedicated Collections** – NWF follows Statement of Federal Financial Accounting Standards (SFFAS) No. 43, *Funds from Dedicated Collections*, which requires separate identification of funds from dedicated collections on the Balance Sheets, Statements of Changes in Net Position, and other selected footnotes.

Funds from dedicated collections are financed by specifically identified revenues, often supplemented by other financing sources, which remain available over time. These specifically identified revenues and other financing sources are required by statute to be used for designated activities, benefits or purposes, and must be accounted for separately from the Government's general revenues (see Note 11).

**Investments** – Investments are in U.S. Treasury securities and are stated at cost net of amortized premiums and discounts as it is the Department's intent to hold the investments to maturity. Premiums and discounts are amortized using the effective interest yield method (see Note 4).

**General Property, Plant, and Equipment** – Purchases of general property, plant, and equipment (PP&E) exceeding $50 are capitalized if they have a useful life greater than two years. PP&E is depreciated on a straight-line basis over the estimated useful lives of the assets. Useful lives range from 5 to 30 years. Maintenance costs are borne by NWF for equipment either on loan from or shared with other programs.

**Accounts Receivable** – Payment of accounts receivable will not be complete until NWF starts accepting waste. Interest is accrued quarterly on the outstanding amount receivable including accrued interest. The interest rate used is the 13-week U.S. Treasury bill rate. An allowance for doubtful accounts related to one-time spent fuel fees has not been recorded as of September 30, 2016 or 2015.

**Accrued Investment Interest Receivable** – Investment interest is accrued on the outstanding investment balance using the applicable interest rate for the investments.

**Liabilities** – Liabilities represent the amount of monies or other resources that are likely to be paid by NWF as the result of a transaction or event that has already occurred. However, no liability can be paid by NWF absent an appropriation. Liabilities for which an appropriation has not been enacted are therefore classified in these notes as liabilities not covered by budgetary resources and there is no certainty that the appropriation will be enacted. Also, liabilities other than contracts can be abrogated by the Government acting in its sovereign capacity.

**Tax Status** – NWF, as a part of the Department of Energy, which is a Federal agency, is not subject to federal, state, or local income taxes.

**First Repository Costs** – For the fiscal years ended September 30, 2016 and 2015, first repository costs consist primarily of Yucca Mountain shutdown costs. Historically, the general goals have been that of licensing and construction of a permanent repository for nuclear waste at Yucca Mountain and to be ready for acceptance of waste at the facility.

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## (2) Significant Accounting Policies (continued)

**Retirement Plans** – *Contractor Employees* – NWF follows the requirements of the Financial Accounting Standards Board's Accounting Standards Codification Topic 715, "*Compensation – Retirement Benefits*" for contractor employees. NWF's former integrated contractors maintain defined benefit pension plans under which they promise to pay employees specified benefits. NWF's cost under the contract includes reimbursement of annual employer contributions to the pension plans. NWF was historically the predominant fund for one integrated contractor and therefore recorded the net assets or liabilities of that former contractor's plans as if it were the plan sponsor. In FY 2011, the NWF made additional contributions to fully fund that former contractor's defined benefit pension plan and thus significantly reduce or eliminate required future contributions. The remaining net assets or liabilities of that former contractor's plans have been the responsibility of the NWF and therefore were reflected in the NWF statements. On December 31, 2014, the former contractor's post-retirement benefit plan was terminated. On December 31, 2015, the former contractor's defined benefit pension plan was also terminated resulting in lump sum distributions or annuity purchases for participants and bringing both the projected benefit obligation and assets in the plan to zero.

**Use of Estimates** – The preparation of financial statements requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Significant items subject to such estimates and assumptions include estimated lives of general property, plant, and equipment and commitments and contingencies.

## (3) Fund Balance with Treasury

Summaries of the status of fund balances with the U.S. Treasury for appropriated and special funds as of September 30, 2016 and 2015 are as follows:

| **As of September 30, 2016** | Appropriated Funds | Special Funds | Total |
|---|---|---|---|
| Unobligated budgetary resources | | | |
| Available | $ 5,719 | $ 12,785 | $ 18,504 |
| Obligated balance not yet disbursed | | | |
| Undelivered orders | 8,432 | 4,099 | 12,531 |
| Accounts payable and other liabilities | - | 992 | 992 |
| Budgetary resources invested in Treasury securities | - | (16,383) | (16,383) |
| **Total FY 2016 Fund Balance with Treasury** | **$ 14,151** | **$ 1,493** | **$ 15,644** |

| **As of September 30, 2015** | Appropriated Funds | Special Funds | Total |
|---|---|---|---|
| Unobligated budgetary resources | | | |
| Available | $ 5,713 | $ 13,290 | $ 19,003 |
| Obligated balance not yet disbursed | | | |
| Undelivered orders | 10,763 | 6,371 | 17,134 |
| Accounts payable and other liabilities | 94 | 371 | 465 |
| Budgetary resources invested in Treasury securities | - | (13,564) | (13,564) |
| **Total FY 2015 Fund Balance with Treasury** | **$ 16,570** | **$ 6,468** | **$ 23,038** |

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## (4) Investments and Related Interest, Net

For the fiscal years ended September 30, 2016 and 2015, the NWF received proceeds from the maturity of securities of $1,700,579 and $1,511,170, respectively.

Investments in U.S. Treasury securities held as of September 30 of each year consisted of the following:

| | FY 2016 | FY 2015 |
|---|---|---|
| Intragovernmental Non-Marketable Market Based: | | |
| Face Value | $ 52,424,406 | $ 51,811,861 |
| Unamortized discount, net | (16,485,067) | (17,595,620) |
| Interest receivable | 87,962 | 78,859 |
| Investments and related interest, net | 36,027,301 | 34,295,100 |
| Unrealized market gains, net | 9,946,860 | 8,109,282 |
| Investments at fair value | $ 45,974,161 | $ 42,404,382 |

The federal government does not set aside assets to pay for expenditures associated with the funds for which the Department holds Treasury securities. These Treasury securities are an asset to the Department and a liability to Treasury. Because the Department and Treasury are both parts of the federal government, these assets and liabilities offset each other from the standpoint of the federal government as a whole. For this reason, they do not represent an asset or a liability in the U.S. Government-wide financial statements. Treasury securities provide the Department with authority to draw upon the U.S. Treasury to make expenditures, subject to available appropriations and Office of Management and Budget (OMB) apportionments. When the Department requires redemption of these securities, the federal government finances those expenditures out of accumulated cash balances by raising taxes or other receipts, by borrowing from the public, repaying less debt, or by curtailing other expenditures. This is the same way the federal government finances all other expenditures.

## (5) Receivables Due from Utilities

Owners and generators of civilian SNF and HLW have entered into contracts with the Department for disposal services and for payment of fees to the NWF.

The NWPA specifies two types of fees to be paid to the NWF for disposal services: (a) a one-time charge per kilogram of heavy metal in solidified SNF or HLW existing prior to April 7, 1983; and (b) a one mil per kWh fee on all net electricity generated and sold by civilian nuclear power reactors on and after April 7, 1983. The kWh fees are due when billed. The contracts between the Department and the owners and generators of the waste provide three options for payment of the one-time spent fuel fee, one of which must have been selected by June 30, 1985, or within two years of contract execution. The options were:

1. Payment of the amount due, plus interest earned from April 7, 1983, in 40 quarterly installments with the final payment due on or before the first scheduled delivery of SNF to the Department;

2. Payment of the amount due, plus interest from April 7, 1983, in a single payment any time prior to the first delivery of SNF to the Department; or

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## (5) Receivables Due from Utilities (continued)

3. Payment of the amount due any time prior to June 30, 1985, or two years after contract execution, in the form of a single payment, with no interest due.

Under options (1) and (2), interest accrues from April 7, 1983 to the date of first payment at the 13-week U.S. Treasury bill rate compounded quarterly. Under option (1), beginning with the first payment, interest is calculated at the 10-year Treasury note rate in effect at the time.

In fiscal year 2016, payments of $82,108 of one-time accrued spent fuel fees and $219,843 of accrued interest were received from owners and generators of civilian SNF and HLW. For the fiscal year ended September 30, 2015 there were no payments or adjustments of one-time spent fuel fees.

Per the NWPA, the Secretary of Energy shall annually review the adequacy of the fees established. In the event the Secretary of Energy determines either insufficient or excess revenue is being collected, the Secretary of Energy shall propose an adjustment to the fee to ensure full cost recovery. Because the U.S. Court of Appeals for the District of Columbia Circuit found the Department did not have a legitimate basis to evaluate the ongoing kWh fee, the court directed the Department to propose to Congress a reduction of the ongoing kWh fee to zero. Such proposal became effective on May 16, 2014. In August 2014, the Department collected the remaining ongoing fee receivable balances. The situation has remained unchanged for FY 2015 and FY 2016 and no ongoing kWh fees were assessed or collected.

Accounts receivable from utilities at September 30 of each year were as follows:

| | FY 2016 | FY 2015 |
|---|---|---|
| Accounts receivable: | | |
| One-time spent nuclear fuel fees: | | |
| Accounts receivable - one-time spent nuclear fuel fees | | |
| Option (1) | $ 144,273 | $ 144,273 |
| Option (2) | 610,564 | 692,672 |
| Total accounts receivable one-time spent nuclear fuel fees | 754,837 | 836,945 |
| Accrued interest on one-time spent nuclear fuel fees: | | |
| Option (1) | 387,124 | 386,134 |
| Option (2) | 1,646,632 | 1,861,743 |
| Total accrued interest on one-time spent nuclear fuel fees | 2,033,756 | 2,247,877 |
| Total accounts receivable | $ 2,788,593 | $ 3,084,822 |

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## (6) General Property, Plant, and Equipment, Net

General property, plant, and equipment and related accumulated depreciation consisted of the following as of September 30, 2016 and 2015:

| | FY 2016 | FY 2015 |
|---|---|---|
| General property, plant, and equipment | $ 7,625 | $ 8,032 |
| Less accumulated depreciation | (7,493) | (7,850) |
| General property, plant, and equipment, net | $ 132 | $ 182 |

## (7) Transactions with the Department and Other Federal Government Agencies

The NWPA authorized the Secretary of Energy to carry out the provisions of the NWPA and created the Nuclear Waste Fund in the U.S. Treasury. The investment and borrowing powers of the NWF are limited to transactions with the U.S. Treasury. In discharging its obligations under the NWPA, the Department contracts for services with numerous contractors including other Federal Government agencies. Further, significant administrative services are provided by the Department.

As of September 30, 2016 and 2015, NWF owed other Federal Government agencies $1 and $95, respectively, for services and costs provided to NWF. For the fiscal years ended September 30, 2016 and 2015, NWF incurred costs of ($83) and $576, respectively, for services and goods provided by other Federal Government agencies. In addition to these incurred costs, NWF made Congressional authorized transfers from the NWF to the Nuclear Waste Technical Review Board in the amount of $3,600 for fiscal year 2016 and $3,400 for fiscal year 2015.

NWF has entered into Memoranda of Agreement (MOA) with the Department's Office of Environmental Management and the Department's Office of Naval Nuclear Propulsion. The MOA established the terms and conditions for acceptance of Department-owned SNF and HLW (Defense Waste) for disposal. The estimated liabilities are included in the 2008 TSLCC that is used to calculate the estimate of the Department's share of total current and future program costs for Defense Waste. The Department has paid amounts in excess of its estimated share of costs and as a result has no liability to NWF as of September 30, 2016 and 2015.

As of September 30, 2016, the share of costs for the Department's Defense Waste is estimated, based on the methodology published in the Federal Register in August 1987, to be $2,448,189 and interest owed is estimated to amount to $672,737. As of September 30, 2016 and 2015, $633,944 and $633,490, respectively, was included in intragovernmental deferred revenue representing the Department's Defense HLW fees in the NWF in excess of the Department's cost share to-date.

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## (8) Liabilities Not Covered by Budgetary Resources

A summary of liabilities covered and not covered by budgetary resources as of September 30, 2016 and 2015 is as follows:

| | FY 2016 | FY 2015 |
|---|---|---|
| Liabilities not covered by budgetary resources: | | |
| Intragovernmental | | |
| Deferred revenue (Note 10) | $ 633,944 | $ 633,490 |
| Non-Intragovernmental | | |
| Deferred revenue (Note 10) | 38,182,583 | 36,752,793 |
| Commitments and contingencies (Note 9) | 24,689,260 | 23,699,690 |
| Total liabilities not covered by budgetary resources | 63,505,787 | 61,085,973 |
| Liabilities covered by budgetary resources: | | |
| Intragovernmental | | |
| Accounts payable | 1 | 95 |
| Other liabilities | 197 | 197 |
| Non-Intragovernmental | | |
| Accounts payable and other liabilities | 794 | 190 |
| Total liabilities covered by budgetary resources | 992 | 482 |
| Total Liabilities | $ 63,506,779 | $ 61,086,455 |

## (9) Commitments and Contingencies

*Spent Nuclear Fuel Litigation*

In accordance with the NWPA, the Department entered into contracts with more than 45 utilities (standard contracts) in which, in return for payment of fees into the NWF, the Department agreed to begin disposal of SNF by January 31, 1998. Because the Department has no facility available to receive SNF under the NWPA, it has been unable to begin disposal of the utilities' SNF as required by the contracts. Significant litigation claiming damages for partial breach of contract has ensued as a result of this delay.

To date, 38 suits have been settled involving utilities that collectively produce about 83 percent of the nuclear-generated electricity in the United States. Under the terms of the settlements, the Judgment Fund, 31 U.S.C. 1304, paid $4.4 billion as of September 30, 2016 to the settling utilities for delay damages they have incurred through September 30, 2016. In addition, 41 cases have been resolved by final unappealable judgments. Eight of those cases resulted in an award of no damages by the trial court and 28 of the 33 remaining cases, as well as two partial judgments, resulted in a total of $1.7 billion in damages, which has been paid by the Judgment Fund as of September 30, 2016. The five other final unappealable judgments, totaling $161.5 million are planned for payment in 2017.

The Department's SNF litigation liability is updated to include the effects of final judgments and settlements as well as payments to date from the Judgment Fund. Additional payments under these settled and adjudicated cases may be made if the utilities incur additional costs before the Department permanently disposes of the SNF. The Department believes its assumptions and methodology provide a reasonable basis for the contingent liability estimate.

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## (9) Commitments and Contingencies (continued)

Eleven cases remain pending either in the Court of Federal Claims or in the Court of Appeals for the Federal Circuit. Liability is probable in these cases, and in many of these cases orders have already been entered establishing the Government's liability and the only outstanding issue to be litigated is the amount of damages to be awarded. The industry is reported to estimate that damages for all utilities with which the Department has contracts ultimately will be at least $50 billion. The Department believes that the industry's estimate is highly inflated and that the disposition of the 79 cases that have either been settled or subject to a judgment in the trial court suggests that the Government's ultimate liability is likely to be significantly less than that estimate. Accordingly, based on these settlement estimates, the total liability estimate as of September 30, 2016 is $30.8 billion. After deducting the amount paid of $6.1 billion as of September 30, 2016 under these settlements and as a result of final judgments, the remaining liability is estimated to be approximately $24.7 billion. Under current law, any damages or settlements in this litigation will be paid out of the Judgment Fund. The Department's contingent liability estimate for SNF litigation is reported net of amounts paid to date from the Judgment Fund.

The Department previously reported several developments that made it difficult to reasonably predict the amount of the Government's likely liability. The courts have since resolved that jurisdiction for these cases is appropriate in the Court of Federal Claims and that the Government cannot assert the unavoidable delays defense, under which, if it were applicable, the Government would not be liable for any damages. The Administration has determined that the development of a repository at Yucca Mountain is unworkable and directed the Secretary to establish the Blue-Ribbon Commission (the Commission) on America's Nuclear Future to evaluate alternative approaches for meeting the Federal Government's responsibility. The Commission submitted a final report in January 2012 with its recommendations for consideration by the Administration and Congress. The Administration issued the "Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Waste" on January 11, 2013 (Strategy). The successful implementation of the Strategy is contingent on new statutory authority and the availability of appropriations. In the interim, the Department's position is that its existing SNF litigation model provides a reasonable basis for its accounting liability estimate using key assumptions from the Strategy : (1) a pilot storage facility will be operational in 2021 to allow for the removal of SNF from shut down reactors; (2) an interim storage facility will be operational in 2025 to begin the removal of SNF from operating nuclear power reactors and (3) that reactors will incur costs reimbursable by the Department until the Department has fulfilled its obligations under the agreements. Because legislation has not passed, operational dates were moved forward two years for the purposes of estimating the liability.

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## (10) Deferred Revenue

As described in Note 2, all fees, both kWh fees and Defense high-level radioactive waste fees, as well as the related interest and investment income, are recognized as revenue to the extent of expenses incurred. Amounts in excess of current expenses are deferred. Deferred revenue as of September 30, 2016 and 2015 was as follows:

| | FY 2016 | FY 2015 |
|---|---|---|
| Intragovernmental | | |
| Fees billed: | | |
| Defense high-level waste fees | $ 2,325 | $ 2,573 |
| Interest: | | |
| Income on investments | 1,431,015 | 1,395,884 |
| Non-intragovernmental | | |
| Interest: | | |
| One-time spent nuclear fuel fees | 5,721 | 833 |
| Other billings | 16 | 88 |
| Total billings and interest | 1,439,077 | 1,399,378 |
| Less earned revenue | (8,833) | (7,706) |
| Change in deferred revenue | 1,430,244 | 1,391,672 |
| Deferred revenue - beginning balance | 37,386,283 | 35,994,611 |
| Deferred revenue - ending balance | $ 38,816,527 | $ 37,386,283 |

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## (11) Dedicated Collections

| | Dedicated Collections | All Other Funds | FY 2016 | Dedicated Collections | All Other Funds | FY 2015 |
|---|---|---|---|---|---|---|
| **Balance Sheet** | | | | | | |
| **Assets** | | | | | | |
| Fund Balance with Treasury | $ 1,493 | $ 14,151 | $ 15,644 | $ 6,468 | $ 16,570 | $ 23,038 |
| Investments, Net | 36,027,301 | - | 36,027,301 | 34,295,100 | - | 34,295,100 |
| Accounts Receivable | 2,788,593 | - | 2,788,593 | 3,084,822 | - | 3,084,822 |
| Prepaid Pension Asset, Net | - | - | - | 99 | - | 99 |
| General Property, Plant, and Equipment, Net | 101 | 31 | 132 | 136 | 46 | 182 |
| Total Assets | $ 38,817,488 | $ 14,182 | $ 38,831,670 | $ 37,386,625 | $ 16,616 | $ 37,403,241 |
| **Liabilities and Net Position** | | | | | | |
| Accounts Payable and Other Liabilities | $ 992 | $ - | $ 992 | $ 388 | $ 94 | $ 482 |
| Deferred Revenue | 38,816,496 | 31 | 38,816,527 | 37,386,237 | 46 | 37,386,283 |
| Commitments and Contingencies | - | 24,689,260 | 24,689,260 | - | 23,699,690 | 23,699,690 |
| Unexpended Appropriations | - | 14,151 | 14,151 | - | 16,476 | 16,476 |
| Cumulative Results of Operations | - | (24,689,260) | (24,689,260) | - | (23,699,690) | (23,699,690) |
| Total Liabilities and Net Position | $ 38,817,488 | $ 14,182 | $ 38,831,670 | $ 37,386,625 | $ 16,616 | $ 37,403,241 |
| **Statement of Net Costs** | | | | | | |
| Total First Repository and Other Program Costs | $ 6,494 | $ 2,339 | $ 8,833 | $ 5,099 | $ 2,607 | $ 7,706 |
| Less Earned Revenues | (6,494) | (2,339) | (8,833) | (5,099) | (2,607) | (7,706) |
| Net First Repository Costs | - | - | - | - | - | - |
| Estimated liability for waste acceptance obligations | - | 1,785,763 | 1,785,763 | - | 1,898,995 | 1,898,995 |
| Net cost of operations | $ - | $ 1,785,763 | $ 1,785,763 | $ - | $ 1,898,995 | $ 1,898,995 |
| **Statement of Changes in Net Position** | | | | | | |
| Beginning Balance - Cumulative Results of Operations | $ - | $ (23,699,690) | $ (23,699,690) | $ - | $ (22,633,674) | $ (22,633,674) |
| Imputed Financing from Costs Absorbed by Others | - | 796,193 | 796,193 | - | 832,979 | 832,979 |
| Net Cost of Operations | - | (1,785,763) | (1,785,763) | - | (1,898,995) | (1,898,995) |
| Ending Balance - Cumulative Results of Operations | $ - | $ (24,689,260) | $ (24,689,260) | $ - | $ (23,699,690) | $ (23,699,690) |
| Beginning Balance - Unexpended Appropriations | $ - | $ 16,476 | $ 16,476 | $ - | $ 19,049 | $ 19,049 |
| Appropriations Used | - | (2,325) | (2,325) | - | (2,573) | (2,573) |
| Ending Balance - Unexpended Appropriations | - | 14,151 | 14,151 | - | 16,476 | 16,476 |
| Total Net Position | $ - | $ (24,675,109) | $ (24,675,109) | $ - | $ (23,683,214) | $ (23,683,214) |

The NWPA requires the owners and generators of nuclear waste to pay their share of disposal costs into the NWF and, to that end, established a fee for electricity generated and sold by civilian nuclear power reactors which the Department must collect and annually assess to determine its adequacy. A special fund within Treasury was created to account for the collection of those fees. Fees collected in excess of expenses incurred are invested in Treasury securities and any interest earned is available to pay expenditures related to radioactive waste disposal activities covered by the NWF as appropriated by Congress and allotted by OMB.

## (12) Explanation of Differences between the Statement of Budgetary Resources and the Budget of the United States Government

The NWF FY 2015 *Statement of Budgetary Resources* reconciled to the Budget of the United States by combining both of the budgets for Defense Nuclear Waste Disposal (89-X-0244) and Nuclear Waste Disposal (89-X-5227). The President's Budget containing actual FY 2016 balances is expected to be published and available on the OMB website in February 2017. Budgetary resources and obligations incurred are reconciled to the Departmental balances as published in the Appendix to the Budget; distributed offsetting receipts and net outlays are reconciled to the Departmental Balances in the Federal Program by Agency and Account section of the Analytical Perspectives Volume of the President's Budget.

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## (13) Reconciliation of Net Cost of Operations to Budget

The objective of this information is to provide an explanation of the differences between budgetary and financial (proprietary) accounting. This is accomplished by means of a reconciliation of budgetary obligations and non-budgetary resources available to the reporting entity with its net cost of operations.

| | FY 2016 | FY 2015 |
|---|---|---|
| **RESOURCES USED TO FINANCE ACTIVITIES:** | | |
| Budgetary Resources Obligated: | | |
| Obligations Incurred | $ 977 | $ 1,025 |
| Less: Spending Authority from Offsetting Collections and Recoveries | (478) | (3,794) |
| Obligations, Net of Offsetting Collections and Recoveries | 499 | (2,769) |
| Offsetting Receipts: | | |
| Fees for Disposal of Spent Nuclear Fuel | (82,108) | - |
| Earnings on Investments | (1,652,427) | (1,429,413) |
| Total Offsetting Receipts | (1,734,535) | (1,429,413) |
| Net Obligations | (1,734,036) | (1,432,182) |
| Other Resources: | | |
| Imputed Financing from Costs Absorbed by Others | 796,193 | 832,979 |
| Other: | | |
| Offsetting Receipts, Deferred | 1,917,930 | 1,892,049 |
| Adjustment for Department of Energy Appropriation | (2,325) | (2,573) |
| Total Other | 1,915,605 | 1,889,476 |
| Net Other Resources Used to Finance Activities | 2,711,798 | 2,722,455 |
| Total Resources Used to Finance Activities | $ 977,762 | $ 1,290,273 |
| **RESOURCES USED TO FINANCE ITEMS NOT PART OF THE NET COST OF OPERATIONS:** | | |
| Change in Resources Obligated for Goods/Services/Benefits Ordered But Not Yet Provided | $ 4,603 | $ 7,037 |
| Total Resources Used to Finance Items Not Part of the Net Cost of Operations | 4,603 | 7,037 |
| Total Resources Used to Finance the Net Cost of Operations | $ 982,365 | $ 1,297,310 |
| **NET COST ITEMS THAT DO NOT REQUIRE OR GENERATE RESOURCES IN CURRENT PERIOD:** | | |
| Increases in Unfunded Liability Estimates | $ 989,652 | $ 1,066,005 |
| Components Not Requiring or Generating Resources: | | |
| Depreciation and Amortization of Investment Premiums and Discounts | (186,239) | (464,238) |
| Revaluation of Assets and Liabilities | (15) | (82) |
| Total Components Not Requiring or Generating Resources | (186,254) | (464,320) |
| Total Net Cost Items That Do Not Require or Generate Resources in Current Period | 803,398 | 601,685 |
| **NET COST OF OPERATIONS** | $ 1,785,763 | $ 1,898,995 |

# UNITED STATES DEPARTMENT OF ENERGY
# NUCLEAR WASTE FUND

Other Information - Schedule I
Schedule of Cumulative Net First and Second Repository Costs for the
Thirty Four Years Ended September 30, 2016 – **(Unaudited)**

(Dollars in thousands unless otherwise noted)

| | | |
|---|---|---|
| First Repository Costs | $ | 7,512,727 |
| All Other Program Costs: | | |
| Program Support | | 2,180,117 |
| Transfers of Appropriations | | 670,697 |
| Waste Acceptance, Storage and Transportation | | 773,685 |
| Imputed and Other Costs | | 152,506 |
| Total All Other Program Costs | | 3,777,005 |
| Second Repository Costs | | 108,896 |
| Total First and Second Repository Costs and Other Program Costs | | 11,398,628 |
| Less Earned Revenue | | (11,380,092) |
| Cumulative Net First and Second Repository Costs | $ | 18,536 |

# UNITED STATES DEPARTMENT OF ENERGY
# NUCLEAR WASTE FUND

Other Information - Schedule II
Schedule of Cumulative Billings and Interest and Deferred Revenue as of and for the
Thirty Four Years Ended September 30, 2016 – **(Unaudited)**

(Dollars in thousands unless otherwise noted)

| | | |
|---|---|---|
| Intragovernmental: | | |
| Fees billed: | | |
| kWh fees | $ | 996,143 |
| One-time spent nuclear fuel fees | | 174,598 |
| Defense high-level waste fees | | 3,754,926 |
| Interest: | | |
| Income on investments | | 21,678,317 |
| Non-intragovernmental: | | |
| Fees billed: | | |
| kWh fees: | | 18,308,083 |
| One-time spent nuclear fuel fees | | 2,174,802 |
| Interest: | | |
| One-time spent nuclear fuel fees | | 2,402,194 |
| Other billings | | 707,556 |
| Total billings and interest | | 50,196,619 |
| Less earned revenue | | (11,380,092) |
| Deferred revenue | $ | 38,816,527 |

## FEEDBACK

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Office of Inspector General (IG-12)
Department of Energy
Washington, DC 20585

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# APPENDIX B

# DOE Memorandum: Liability Estimate
# November 6, 2012

DOE F 1325.8
(08-93)

United States Government **Department of Energy**

# memorandum

DATE: NOV 6 2012

REPLY TO ATTN OF: GC-55

SUBJECT: Liability Estimate

TO: Joanne Choi
Acting Chief Financial Officer, CF-1

This memorandum sets forth the Office of Standard Contract Management's current estimate of the United States Government's liability in connection with the Government's partial breach of the "standard contracts" that it executed pursuant to the Nuclear Waste Policy Act of 1982 (NWPA). The Office of Standard Contract Management estimates that liability, as of today and based on the analysis and qualifications set forth below, to be $19.7 billion. Section 302 of the NWPA requires that the standard contracts provide that "in return for the payment of fees established by [the NWPA], the Secretary, beginning not later than January 31, 1998, will dispose of the high-level radioactive waste or spent nuclear fuel involved . . . ." The contracts do not require that the Government begin accepting any particular company's spent fuel by that date; rather, a queue has been established that sets forth the priority and order in which spent fuel is to be accepted.

As of the date of this memorandum, the Government has not begun accepting commercial spent nuclear fuel for disposal, and has conceded that it has partially breached the standard contracts it entered into pursuant to the NWPA. The Government has not admitted, nor has any plaintiff claimed, a total breach of the standard contracts because, among other things, the Government still intends and still is obligated by law to accept for disposal the spent nuclear fuel covered by the standard contracts.

The Administration has decided it will no longer pursue development of a repository at Yucca Mountain. The Secretary of Energy, acting at the direction of the President, established the Blue Ribbon Commission (the Commission) on America's Nuclear Future to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle, including all alternatives for the storage, processing, and disposal of civilian and defense used nuclear fuel, high-level waste, and materials derived from nuclear activities. The Commission submitted a final report in January 2012 with their recommendations on these issues for consideration by the Administration and Congress, as well as interested state, tribal and local governments, other stakeholders, and the public. The Administration has undertaken a thorough review of their recommendations in the areas of governance and funding, consolidated storage, facility siting, and waste disposal. Given the range of issues and their complexity, the Administration's response to the BRC recommendations remains

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under development within the Administration. As a result, until further policy guidance is provided, the Office of Standard Contract Management is no longer able to estimate a date for the commencement of operations of a DOE facility for the acceptance of spent fuel and high-level radioactive waste. Accordingly, this estimate is based upon guidance received from your office as to the acceptance date to be utilized in the calculation of the Department's liability (see memo "Interim Update of DOE'S SNF Litigation Liability" dated Oct. 10, 2012, attached). Furthermore, we continue to assume that once the Department begins accepting fuel, it, of course, will not be able to accept the entire Nation's spent fuel at once – instead, it plans to accept the fuel at a steady pace according to the queue that has been established. That means that the Department may not begin accepting spent fuel from some utilities for several years after the commencement of receiving operations.

Background

Currently, there are 72 commercial nuclear reactor sites, with 104 operating reactors and 14 reactors that have been shut down. As of end of 2011, about 66,600 MTHM of spent fuel was stored at commercial sites. At-reactor dry storage capacity was approximately 17,100 MTHM as of December 2011. The currently-operating reactors have an annual aggregate spent fuel discharge rate of 1,800 to 2,200 MTHM per year, although there obviously is substantial variability in that number depending on a variety of factors, such as technical and operational issues at particular facilities, fuel cycle designs, etc.

It is currently projected that in 2020, the cumulative discharge of spent fuel from commercial reactors in the United States will total approximately 85,200 MTHM.

Current litigation

A number of parties who entered into standard contracts with the Government have sued the United States in the U.S. Court of Federal Claims. In general, those lawsuits argue that the Government is in partial breach of the standard contracts, and claim damages due to that breach. The U.S. Court of Appeals for the Federal Circuit has held, in general, that in these lawsuits the plaintiffs only are entitled to recover as damages the costs that they incurred prior to trial and solely due to the Government's breach. This means that the only damages for which the Government is liable are the costs that a plaintiff has incurred, as a direct result of the Government's partial breach, to store spent nuclear fuel covered by a standard contract.

The lawsuits in the Court of Federal Claims are at various procedural stages, and are pending before a variety of different judges; the cases have not been consolidated in any way. Because the cases are pending before different judges, the facts in each case are different, the cases are at various stages of fact discovery and motions practice, and a number of particularized fact and law issues must be resolved in each case to determine what if any recoverable damages a plaintiff has incurred, it is very difficult

to make predictions about the outcomes of the pending cases. As a result, a contingency must be added to any estimate of liabilities.

The plaintiffs in some cases have settled with the Government, and therefore in those cases we know with a relatively good degree of certainty what the Government's financial exposure is to those plaintiffs, assuming the repository opens on the schedule set forth above. Those settlements are described later in this memorandum. Given the variability of the fact situations involved with utilities throughout the country, and the unknowns that are presented with respect to the reasons and timing of each utility's decisions about at-reactor storage of spent nuclear fuel – some of which are the very questions currently being litigated in the Court of Federal Claims – it is difficult to estimate with any high degree of precision the Government's ultimate liability in connection with this litigation. Because it is not possible to predict outcomes of the litigation, the most appropriate method of estimating the Government's total aggregate liability in connection with the standard contract litigation is to look to the settlements that the Government has entered into with some plaintiffs, and seek to extrapolate those settlements to the other entities that have sued the United States. This method of estimation is certain to overestimate in some cases and underestimate in other cases the actual damages that the Government may ultimately pay, either through settlements or judgments, to some of the plaintiffs. As a result, the estimate being provided here is not intended to be a prediction about the outcomes of pending litigation, but rather is intended to be a reasonable estimate.

For all of these reasons, the Office of Standard Contract Management is using the settlements as the basis for its liability estimate at this time. Set forth below is a brief description of each of the twenty-three settlements that have been entered into to date. These settlements cover 66 percent of the nuclear power reactors under contract with the Department for disposal (78[1]/118). For these reasons, the Office of Standard Contract Management believes it is appropriate at this time to use these settlements as the basis for estimating the Government's aggregate litigation-related liability relating to the Government's partial breach of the standard contract.

Exelon Framework Settlements

Exelon Settlement

The Exelon settlement resolved all pending spent nuclear fuel litigation brought against the Government by Exelon and its subsidiaries Exelon Generation Company, Commonwealth Edison Company and AmerGen Energy Company. Collectively, those companies own 20 of the 118 nuclear reactors, including three shutdown reactors, covered by the standard contract. Under the settlement agreement, the Government will reimburse Exelon for the actual incurred costs of spent fuel storage that are directly attributable to the Government's failure to begin accepting spent fuel

[1] This 78 does not include the Columbia reactor covered under the Energy Northwest settlement. It is not used in calculating the liability estimate.

by January 31, 1998. The agreement provides for an initial payment from the Judgment Fund (not from the Nuclear Waste Fund or from appropriations made to the Department) of approximately $80 million to cover the actual costs of additional spent fuel storage already incurred by Exelon as of the date of the settlement. Future reimbursements would be made only after actual incurred costs have been verified by the Department as being both allowable and reasonable, as defined in the agreement, and would be reimbursed on an annual basis.

The Exelon Settlement Agreement established acceptance rates, i.e., rates at which the delay damages are calculated under the Agreement, that were significantly lower - 900 MTHM per year through 2014 and 2,100 MTHM per year thereafter – than the 3,000 MTHM per year planned by the Department for steady-state repository operations. It is this provision in the Settlement Agreement that allows the Department eventually to "catch up" on acceptance and to terminate payments under the Settlement Agreement. Exelon will incur reimbursable costs for spent fuel storage until the Department has caught up on the backlog of spent fuel that has accumulated as a result of the delay in beginning acceptance and is picking up Exelon's fuel on time according to the acceptance schedule. The point at which the Department has caught up with the acceptance of spent fuel is referred to as the crossover point.

South Carolina Electric and Gas Settlement

The Department's settlement with South Carolina Electric and Gas and South Carolina Public Service Authority (collectively SCE&G) resolved all of SCE&G's pending spent nuclear fuel litigation against the Government. The settlement covered one reactor, the Virgil C. Summer Nuclear Station. Under the settlement agreement, which is modeled on the Exelon settlement, the Government reimbursed SCE&G for the actual incurred costs of spent fuel storage that are directly attributable to the Government's delay in beginning fuel acceptance on January 31, 1998.

The agreement provides for an initial payment from the Judgment Fund of $9 million to cover the actual costs of additional spent fuel storage already incurred by SCE&G (from January 31, 1998 through July 31, 2005). All future reimbursements, which also will be paid from the Judgment Fund and will be made on an annual basis, will be made only after incurred costs have been verified by the Department as being both allowable and reasonable, as defined in the settlement. Just as with the Exelon settlement, the acceptance rates in the SCE&G settlement on which delay damages are calculated are significantly lower - 900 MTHM per year through 2014 and 2,100 MTHM per year thereafter - than what is actually predicted for repository operations (3,000 MTHM per year).

Omaha Public Power District Settlement

The Department's settlement with the Omaha Public Power District (OPPD) resolved all of OPPD's litigation concerning spent fuel. The settlement covers one reactor, the Fort Calhoun Nuclear Power Plant, located near Omaha, Nebraska. Under the

agreement, which again is modeled on the Exelon settlement, the Government reimbursed OPPD for the actual incurred costs of spent fuel storage that are directly attributable to the delay in beginning fuel acceptance on January 31, 1998. The agreement provides for an initial payment from the Judgment Fund of approximately $5 million to cover the actual costs of additional spent fuel storage already incurred by OPPD (from January 31, 1998 through June 30, 2005). All future reimbursements will be made only after incurred costs have been verified by the Department as being both allowable and reasonable, as defined in the agreement.

Duke Power Settlement

The Duke settlement covers the Oconee Nuclear Stations Units 1, 2 and 3, the McGuire Nuclear Stations, Units 1 and 2, and the Catawba Nuclear Station, Units 1 and 2. Under the terms of the settlement agreement, which, like other settlements, is modeled on the Exelon Agreement, the Government reimbursed Duke for the actual incurred costs of spent fuel storage that are directly attributable to the Government's delay in beginning fuel acceptance on January 31, 1998. The agreement provides for an initial payment from the Judgment Fund of approximately $56 million to cover the actual costs of additional spent fuel storage already incurred by Duke (from January 31, 1998 through July 31, 2005).

NextEra Energy Settlement (formerly FPL Group)

The FPL Group settlement resolved three lawsuits, Florida Power and Light (FPL), FPL Energy Seabrook and Interstate Power and Light. The settlement agreement covers six contracts which collectively cover the following eight reactors: Turkey Point Units 3 and 4, St. Lucie Units 1 and 2, Seabrook, Duane Arnold and Point Beach Units 1 and 2. The agreement provided for an initial payment from the Judgment Fund of approximately $124 million and covered the actual costs incurred for spent fuel storage that are directly attributable to the Government's delay in beginning fuel acceptance on January 31, 1998 through December 31, 2007 for all reactors except Point Beach 1 & 2. Point Beach was acquired by FPL Group in October 2007 and rights to seek costs prior to the sale were retained by the former owner. Under the settlement, which was also modeled on the Exelon settlement, future reimbursements are made on an annual basis after incurred costs have been verified by the Department as being both allowable and reasonable. Costs related to Point Beach are reimbursed, per the settlement agreement, from calendar year 2008 forward. The liability estimate for Exelon Framework Settlements includes the one-time settlement of $45,500,000 to Wisconsin Electric Power Company (WEPCO) for the period of time in which WEPCO owned Point Beach Units 1 and 2 for the period 1998 through 2007, when the Point Beach Units were acquired by NextEra. The WEPCO settlement is described further below.

PSEG Nuclear LLC Settlement

PSEG Nuclear LLC ("PSEG Nuclear") and Public Service Electric and Gas Company settled the lawsuit for delay damages arising from their two contracts covering the Hope Creek Generating Station, No. 1 Unit, and Salem Nuclear Generating Station, Nos. 1 and 2 Units. Under the terms of the settlement agreement, the Government reimbursed PSEG Nuclear $57.1 million for the time period January 31, 1998 through December 31, 2007 for spent fuel storage costs actually incurred due to the Department's delay in beginning spent nuclear fuel acceptance on January 31, 1998.

New Framework Settlement Agreements

In March, 2011, the Department of Justice offered to all remaining SNF litigants a New Framework settlement agreement. Among other things, the new framework settlement agreement provides that the Government's performance liability is to be calculated utilizing the acceptance rates included in the 1987 Draft Mission Plan Amendment, rather than the acceptance rates utilized in the Exelon framework settlement agreements. Under this acceptance rate, there is no "crossover point" as described in the previous settlements. Rather, the Government's liability for spent nuclear fuel storage costs will continue until the spent nuclear fuel is removed from the reactor sites covered by a New Framework settlement agreement. The Department of Justice has determined that it will apply these revised terms and conditions to all remaining cases. Accordingly, the New Framework settlement agreement would be applicable to the 78 of the 118 nuclear power reactors covered by a Standard Contract that have not previously entered into an Exelon framework settlement agreement. As of September 30, 2012, fourteen New Framework settlements have been executed.

Tennessee Valley Authority Settlement

There have been a number of one-year settlements with the Tennessee Valley Authority. In 2008, the Tennessee Valley Authority entered into a settlement covering TVA's claim for storage costs actually incurred due to the Government's delay in beginning spent nuclear fuel acceptance on January 31, 1998, limited to TVA's 2005 fiscal year (October 1, 2004 through September 30, 2005). This settlement applied to spent fuel storage costs at its Browns Ferry Nuclear Plant, Units 1, 2, and 3, and Sequoyah Nuclear Plant, Units 1 and 2. The agreement provided for a one-time payment of $10,359,706 from the Judgment Fund.

In 2009, the parties negotiated a separate settlement for storage costs for those units in the amount of $3.7 million for fiscal year 2006 and $9.8 million for fiscal year 2007 ($13.5 million total).

In 2011, the parties negotiated a settlement for storage costs for those units in the amount of $11,497,191 for fiscal year 2008 and for future reimbursements until December 31, 2013 which will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as

defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Nebraska Public Power District Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs at the Cooper Nuclear Station in the amount of $60,572,538 for costs paid through December 31, 2009. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

PPL Susquehanna Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs at two reactors, Susquehanna Steam Electric Station Units 1 and 2, in the amount of $55,283,623 for costs paid through September 30, 2009. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Ameren Missouri (Union Electric) Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs for one reactor, Callaway Unit 1, in the amount of $10,551,469 for costs paid through December 31, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Northern States Power Company Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs for three reactors, Monticello Nuclear Generating Plant and Prairie Island Nuclear Generating Plant Units 1 and 2, in the amount of $99,966,841 for costs paid through December 31, 2008. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Constellation Energy Nuclear Group – Calvert Cliffs Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs for two reactors, Calvert Cliffs Nuclear Power Plant Units 1 and 2, in the amount of $35,450,275 for costs paid through October 31, 2008. All future reimbursements until

December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Luminant Generation Company LLC Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs for two reactors, Comanche Peak Units 1 and 2, in the amount of $24,332,655 for costs paid through February 28, 2011. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Indiana Michigan Power Company Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs for two reactors, D.C. Cook Nuclear Power Plant, Units 1 and 2, in the amount of $14,125,864 for costs paid through May 31, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Constellation Energy Nuclear Group – Ginna Settlement

In 2011, the parties negotiated a settlement for spent fuel storage costs for one reactor, R.E. Ginna Nuclear Power Plant, in the amount of $77,866,467.00 for costs paid through May 31, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

FirstEnergy Settlement

In 2012, the parties negotiated a settlement for spent fuel storage costs for four reactors, Beaver Valley Power Station, Units 1 and 2, Perry Nuclear Power Plant, Unit 1, and Davis Besse Nuclear Power Station, Unit 1 in the amount of $48,060,580.00 for costs paid through September 30, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Detroit Edison Settlement

In 2012, the parties negotiated a settlement for spent fuel storage costs for one reactor, Enrico Fermi Atomic Power Plant, Unit 2, in the amount of $48,338,592 for costs paid through December 31, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Pacific Gas & Electric Settlement

In 2012, the parties negotiated a settlement for spent fuel storage costs for three reactors, Humboldt Bay Power Plant Unit 3 and Diablo Canyon Power Plant Units 1 and 2 in the amount of $266,104,245 for costs paid through December 31, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Dominion Energy Kewaunee, Inc. Settlement

In 2012, the parties negotiated a settlement for spent fuel storage costs for the one-unit Kewaunee reactor in the amount of $6,405,049.50 for costs paid from January 1, 2009 through December 31, 2010. A prior one-time settlement with Dominion Energy Kewaunee, Inc. provided a payment from the Judgment Fund of approximately $20.9 million to cover the actual costs of additional spent fuel storage already incurred by Dominion Energy Kewaunee prior to January 1, 2009. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

Dominion Nuclear Connecticut Settlement

In 2012, the parties negotiated a settlement for spent fuel storage costs for three reactors, Millstone Nuclear Power Station Units 1, 2 and 3, in the amount of $20,013,579.65 for costs paid through December 31, 2010. All future reimbursements until December 31, 2013 will be made only after the Department has verified that the costs have been paid in the claim period and are both allowable and reasonable, as defined in the New Framework Settlement. The Settlement Agreement can be extended by mutual agreement of the parties.

One-Time Settlements

In 2011, the Government entered into a number of settlements that resolved retrospective claims. Generally, these settlements were with companies that no longer own the nuclear power reactor covered by the settlement, and include compensation only from 1998 through the date that the company sold its nuclear power reactor.

Dominion Energy Kewaunee, Inc. Settlement

The Department's settlement with Dominion Energy Kewaunee, Inc. provides for a payment from the Judgment Fund of approximately $20.9 million to cover the actual costs of additional spent fuel storage already incurred by Dominion Energy Kewaunee from January 31, 1998 through December 31, 2008 for the one-unit Kewaunee reactor. In 2012, the Government and Dominion Energy Kewaunee, Inc. negotiated a New Framework Settlement Agreement as described above under the New Framework Settlement Agreement section. As a result, the costs paid under this settlement agreement are considered as a New Framework Settlement cost when calculating the liability estimate.

NYPA (Power Authority of New York) Settlement

Also in 2011 the parties negotiated a one-time settlement of $10,982,729, for costs incurred through November 21, 2000 for two reactors, Fitzpatrick and Indian Point 3 Nuclear Power Stations. The facilities are now owned by Entergy Nuclear, and are not covered by settlement agreements.

Consumers Energy Settlement

Another 2011 one-time settlement resolved damages for claims incurred through April 11, 2007 for Consumers Energy's Palisades Nuclear Power Plant and the onsite storage facility at the Big Rock plant in which Consumers agreed to a settlement of $120 million which was paid by the Judgment Fund to the Nuclear Waste Fund for partial satisfaction of Consumers outstanding one-time fee of $163,102,172.50 and the utility paid the balance of the fee, $43,102,172.50, to the Nuclear Waste Fund. The facilities are now owned by Entergy Nuclear, and are not covered by settlement agreements.

Consolidated Edison Settlement

In the Consolidated Edison case, in 2011, the parties negotiated a one-time settlement of $448,859 (the amount awarded by the trial court), for costs incurred through September 6, 2001 at Units 1 and 2 at the Indian Point Energy Center. The facilities are now owned by Entergy Nuclear, and are not covered by settlement agreements.

Wisconsin Electric Power Company Settlement

Wisconsin Electric Power Company (WEPCO) and the Government agreed to settle claims relating to the Point Beach Nuclear Power Plant in which the trial court awarded WEPCO $50,053,667.00, which, after negotiated deductions, resulted in a one-time settlement of $45,500,000. The Point Beach Nuclear Power Plant is now owned by NextEra Energy, and future claims will be paid in accordance with the terms of the NextEra Energy settlement agreement. As noted above, this payment is included with the Exelon Framework settlements when calculating the liability estimate.

Energy Northwest Settlement

In Energy Northwest, after the Federal Circuit remanded the case in July 2011 to the trial court for further proceedings, the parties agreed to resolve the case for $48,702,551 for damages incurred through August 31, 2006. This is considered a final judgment, not a settlement, for purposes of calculating the liability estimate.

## PAYMENTS

Payments of settlement claims and judgments are made from the Judgment Fund. As of September 30, 2012, the Judgment Fund has made the following payments:

Payments under settlements
Exelon - $562.3 million
SCE&G - $13.8 million
OPPD - $28.0 million
Duke - $114.0 million
NextEra Energy - $261.9 million
Dominion Kewaunee - $20.9 million
PSEG Nuclear - $92.8 million
Wisconsin Electric - $45.5 million
TVA - $71.8 million
Nebraska Public Power District (NPPD) - $79.5 million
PPL Susquehana - $69.8 million
Consumer's Energy - $120 million
New York Power Authority - $11.0 million
Consolidated Edison of New York - $.4 million
Northern States Power Company - $118.6 million
Constellation – Calvert Cliffs - $35.5 million
Ameren Missouri - $10.6 million
Indiana Michigan Power - $33.9 million
Luminant Generation - $43.5 million
Constellation – Ginna - $87.9 million
FirstEnergy - $48.1 million
Detroit Edison - $48.3 million

Payments as a result of a final judgment:
TVA - $34.9 million
Arizona Public Service - $30.2 million
Energy Northwest - $48.7 million
Dominion Nuclear Connecticut - $42.7 million
Dominion Virginia Electric and Power - $112.1 million
Southern California Edison Company - $142.4 million
Carolina Power & Light - $92.0 million
System Fuels Mississippi - $10.2 million
Southern Nuclear - $71.3 million
Entergy Nuclear Indian Point 2 = $103.2 million

In addition, DOE has reviewed three initial settlements and seven annual claims and recommended payment as follows:

Pacific Gas & Electric - $266.1 million
Dominion Energy Kewaunee, Inc. - $6.4 million
Dominion Nuclear Connecticut - $20.0 million
Exelon - $76.9 million
NextEra Energy - $51.0 million
Ameren Missouri - $0.8 million
Northern States Power Company - $20.7 million
FirstEnergy - $9.5 million
Constellation – Calvert Cliffs - $13.7 million
PSEG Nuclear - $11.6 million

Recent Court Decisions

It is worth noting that judges of the Court of Federal Claims have continued to issue opinions and orders entering judgment in favor of plaintiff utilities. In 2006, judgments were entered for four utilities: in Yankee Atomic, the court awarded three utilities, Yankee Atomic, Connecticut Yankee and Maine Yankee a total of approximately $143 million in damages due to the Department's partial breach of the standard contract and in Pacific Gas & Electric, the court awarded damages for partial breach of the standard contract totaling approximately $42.8 million. Since that time, the Court has entered judgments for the utility Sacramento Municipal Utility District in the amount of $39.8 million; in Southern Nuclear in the amount of $77 million; in Northern States in the amount of $116.5 million and in Systems Fuel Arkansas in the amount of $48.7 million. In 2008, four additional judgments were entered against the Government: in Boston Edison in the amount of $40.3 million and in Carolina Power and Light in the amount of $82.8 million and, after the close of the FY 2008 fiscal year, judgments were entered in two Dominion Power cases in the amounts of $42.7 million for Dominion Connecticut and $112.1 million for Dominion Virginia (VEPCO).

In 2009, three judgments were entered against the Government: The courts awarded Wisconsin Electric Power Co. $50 million for its damages, awarded Dairyland Power Cooperative $37.7 million and on remand, awarded Sacramento Municipal Utility District $53.1 million. A number of judgments were also entered against the Government in 2010, including $56.9 million in Energy Northwest; $9.7 million in System Fuels Mississippi; $89 million on remand in the Pacific Gas and Electric cases; $448,859 in Consolidated Edison; $106.1 million in Entergy Nuclear Indian Point; $40 million on remand in Boston Edison; $4.2 million in Entergy Nuclear Generation Co.; $142.4 million in Southern California Edison; $30.2 million in Arizona Public Service Co.; $142.6 million on remand for the three Yankee utilities; and $46.6 million for Entergy Vermont Yankee and $10.6 million in Kansas Gas and Electric.

In 2011, a judgment of $92 million was entered in Carolina Electric and Gas; the Federal Circuit entered a judgment reducing the trial court's award to Energy Northwest by more than $8 million, which the parties later agreed to settle for $48,702,551 million; and in Southern Nuclear, a partial judgment of $17.3 million was entered for Alabama Power Company (the other plaintiffs in the case, Southern Nuclear and Georgia Power, continue to pursue their claims). In addition, the Government agreed to pay judgments entered in 2008 in the two Dominion cases so the Judgment Fund paid $42.7 million to Dominion Nuclear Connecticut and $112.1 million to Dominion Virginia Electric Power Company.

In 2012, final and unappealable judgments were entered in Entergy Nuclear Indian Point in the amount of $103,209,250, in System Fuels Mississippi in the amount of $10,233,253, in Southern California Edison in the amount of $142,394,294 and in Southern Nuclear, a partial judgment of $54,017,080 was entered for Georgia Power.

The Government has filed appeals in all other cases in which judgments have been entered. The various trial courts continue to find that the Department is in partial breach of the standard contract and damages should be awarded. The courts also continue to make determinations of legal and factual issues in each case that are contradictory in many instances and provide no clear guidance regarding disposition of these issues in future cases.

As noted above, decisions in these cases are final orders issued by Court of Federal Claims judges and are subject to appeal to the U.S. Court of Appeals for the Federal Circuit. Because the Government may prevail on some or all issues and because of the courts' continuing inconsistent rulings these judgments were not used as a basis for estimating the litigation liability of the Department for purposes of this memorandum. Rather, the Office of Standard Contract Management used the settlements, which establish known and knowable amounts for which the Government is financially liable.

It should also be noted that in July 2006, a final, non-appealable judgment was entered in a spent nuclear fuel case, Tennessee Valley Authority v. United States. The court

awarded the plaintiff $34.9 million for the Department's partial breach of contract. In that case, a third Court of Federal Claims judge made factual and legal determinations that were disparate from those made on the same issues in the cases discussed above. The Government did not appeal that decision and, accordingly, the judgment became final and non-appealable.

The Cases on Appeal to the Federal Circuit

In August 2008, the U.S. Court of Appeals for the Federal Circuit, in three separate opinions, decided the appeals in the three Yankee cases, the two Pacific Gas and Electric cases and the Sacramento Municipal Utility District case. The court affirmed in part and reversed in part the various lower courts' findings and ordered the cases to be sent back to their respective trial courts for recalculation of damages based on the Federal Circuit's findings. Among other issues the Federal Circuit decided, it found that the annual acceptance rate that increases to 2,650 MTHM/year was the Government's annual rate of acceptance of spent nuclear fuel to be applied in each case before deciding whether the Government's partial breach of contract was a substantial factor in causing the plaintiffs' damages. The time period to seek further review of the Circuit court's determinations expired and the cases were remanded to their respective trial courts for further proceedings consistent with the Federal Circuit's rulings. Subsequently, the Government sought further review by the Federal Circuit of the trial court decisions in those remanded cases and, in May 2012, the Federal Circuit affirmed the trial court's rulings, which are now final and applicable to all pending cases and those filed in the future. An additional nine cases are also on appeal to the Federal Circuit. Accordingly, none of the judgments are final and payable.

Finally, in the pending case, Entergy Nuclear Fitzpatrick, the Government filed an interlocutory appeal to the Federal Circuit requesting a determination whether the Government can assert the unavoidable delays defense as to damages, but not liability. The Federal Circuit heard oral argument on August 6, 2012, but has not ruled on the issue.

It should also be noted that two utility plaintiffs filed appeals to the Federal Circuit of the dismissal of their cases by the Court of Federal Claims. In both cases the trial courts found that the plaintiffs had previously assigned their rights to assert damages claims related to their spent nuclear fuel storage to a third party and therefore had no claims remaining to pursue. The Federal Circuit affirmed the lower court's decision with the result that neither plaintiff was awarded any money damages. In 2011, two other cases were dismissed on the same grounds, i.e., the plaintiffs had no remaining claims to pursue.

Estimate

The Office of Standard Contract Management estimates the Government's liability in relation to its partial breach of the standard contract to be $22.3 billion. The Office of

Standard Contract Management developed this estimate using the Exelon Settlement Model for 40 reactors covered by the Exelon Framework Settlements and a New Framework Settlement Model for the remaining 78 reactors that are or would be covered by the New Framework settlement terms.

Exelon Framework Settlement Model

The Exelon Framework settlements are estimated using the methodology utilized in the 2011 liability estimate. The Office of Standard Contract Management estimates the Government's liability in relation to its partial breach of the standard contract for the 40 reactors covered by Exelon Framework settlements to be $6.2 billion. The Office of Standard Contract Management developed this estimate as follows: 1) The monetary amount of the settlements and claims submitted with Exelon through 2012 was $639.3 million; 2) the number of reactors covered by the settlements was determined to be 20; 3) the number of storage years was determined to be 243.61; 4) the remaining storage years for the period 2012 through 2055 for the reactors covered by the Exelon settlement was determined to be 725.39; 5) the estimate was calculated by dividing the monetary amount of the settlements through 2012 ($639.3 million) by the storage years covered by the settlements through 2012 (243.61 years) resulting in an average of $2.6 million per storage year; and 6) using the average dollar per storage year, the Department estimated that extending the unit value to all future storage years expected to be covered by the Exelon settlement results in a estimated cost of future settlement payments of $1,903.5 million.

A similar process was utilized for the SCE&G, OPPD, Duke, NextEra Energy and PSEG settlements, and resulted in total estimated values of $42.3 million, $94.8 million, $364.5 million, $1,100.8 million, and $320.7 million, respectively.

The Office of Standard Contract Management applied a contingency of 30 percent to the future settlement values calculated above. This contingency reflects the uncertainty inherent in such long term estimates. Applying this contingency amount to the amounts calculated above results in a combined total including contingency of approximately $6.2 billion.

New Framework Settlement Model

The Office of Standard Contract Management estimates the Government's liability for the 78 reactors that are either covered by or would be covered by the New Framework settlement terms to be $16.1 billion.

As noted previously, the prior approach for estimating the Government's liability resulting from the delay in SNF acceptance, which based the estimate upon a "cross-over" date, is not applicable to the New Framework settlements. Instead, the Government's liability continues until the year when the Government has removed all the spent nuclear fuel from the reactor site. This date has been termed the "last year of pickup" date, and is calculated for each reactor based upon the reactor's unique

shutdown date and spent nuclear fuel acceptance allocations. These acceptance allocations are developed by applying the performance acceptance rates contained in the Yucca Mountain license application to the estimated inventory of spent nuclear fuel utilizing the concept of "oldest fuel first" (OFF). Except for the use of the "last year of pickup" date, the method for estimating the liability for utilities that have either agreed with a New Framework settlement or a one-time settlement is the same as for the Exelon Framework settlements. The Office of Standard Contract Management estimates the Government's liability in relation to its partial breach of the standard contract for the 38 reactors using the New Framework Settlement Model to be $7.3 billion.

The Office of Standard Contract Management estimates the Government's liability in relation to its partial breach of the standard contract for the 40 reactors which have not yet agreed with a New Framework Settlement to be $8.8 billion. A total of 2,354 reactor-years of damage are projected for these 40 reactors. The estimate for these 2,354 reactor-years is derived from the average actual damage per reactor-year ($2.877 million) for those utilities which have accepted a New Framework or one-time Settlement, with a contingency of 30 percent applied.

The Government's total liability is the sum of the liability for the utilities that use the Exelon Framework Settlement Model ($6.2 billion), the utilities that have accepted a New Framework or one-time Settlement ($7.3 billion), and the utilities that have not yet accepted a New Framework or One-Time Settlement ($8.8 billion), or $22.3 billion.

After deducting the amount paid to date under these settlements and as a result of final judgments, a total of approximately $2,605.9 million, the remaining liability is estimated to be approximately $19.7 billion.

As noted earlier in this memo, this number is not intended to predict an outcome in any particular case, or estimate the damages (if any) that the Government owes to any particular utility, other than those with which it already has entered into settlements. Rather, this memorandum is intended to set forth an estimate of the Government's total aggregate liability due to its partial breach of the standard contracts. Also as noted above, this estimate will almost certainly be subject to revision in the future, based on future settlements, future judgments, and other developments.

David K. Zabransky, Director
Office of Standard Contract Management
Office of General Counsel

Attachment

**Department of Energy**
Washington, DC 20585
October 10, 2012

MEMORANDUM FOR RICKY R. HASS
DEPUTY INSPECTOR GENERAL FOR
AUDITS AND INSPECTIONS

FROM: JOANNE CHOI
ACTING DEPUTY CHIEF FINANCIAL OFFICER

SUBJECT: Interim Update of the Department of Energy's Spent Nuclear Fuel Litigation Liability

Last year, the Department estimated its liabilities under current law resulting from delaying the beginning of waste acceptance from 1998 to 2020 at $19.1 billion. The Administration has decided it will no longer pursue development of a repository at Yucca Mountain. The Secretary of Energy, acting at the direction of the President, established the Blue Ribbon Commission (the Commission) on America's Nuclear Future to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle, including all alternatives for the storage, processing, and disposal of civilian and defense used nuclear fuel, high-level waste, and materials derived from nuclear activities. The Commission issued a final report January 26, 2012 with their recommendations on these issues. The Department is assessing the recommendations. In the interim, the Department's position is that its existing spent nuclear fuel litigation models provide a reasonable basis for its accounting liability estimate and that no basis exists or is warranted at this time to change.

In the attached report issued to Congress in 2008, the Department lays out a timetable of 6 years from development to acceptance of SNF at an interim facility – one of several alternatives considered by the Commission. While the six years assumes resolution of issues (explained in the report) and the facility is for the consolidation of fuel from decommissioned reactors, it does support the position that the year 2020 is within a yet undefined range of possibilities for addressing the Department's obligations for acceptance of spent nuclear fuel. The interim facility approach outlined in the report is modular and scalable and provides support for the Department's conclusion that the assumptions within the current spent nuclear fuel litigation models are reasonable.

Attachment

cc: Eric Rasmussen, KPMG
David Zabransky, GC-55

# APPENDIX C

## Permanently Shutdown Plants
## Recovering ISFSI Operating Costs from DOE

Appendix C
Permanently Shutdown Plants Recovering ISFSI Operating Costs from DOE

| Plant | Description of Costs Recovered | Source | Enclosure No. |
|---|---|---|---|
| Trojan | ! "Nearly all costs associated with these FTEs [for Trojan security per NRC Security requirements] are reimbursable to PGE through the settlement claim with the Department of Energy for the Trojan Independent Spent Fuel Storage Installation, approved by the U.S. Court of Federal Claims on July 18, 2013." | ! Direct Testimony of Bradley Jenkins and Aaron Rodehorst, Exhibit 700, pages 9-10, *In the Matter of Portland General Electric Company*, Request for a General Rate Revision (Feb. 28, 2017), Docket No UE 319 | 1 |
| | ! Listing 62 FTE equivalents at Trojan and noting: "Required to perform security, operating, maintenance, and administrative functions at the Trojan ISFSI. The ISFSI technicians will report to the ISFSI Supervisor and are responsible for the safe storage of spent nuclear fuel from the Trojan Nuclear Plant. The ISFSI technicians are being added in response to recent NRC Security Inspector comments highlighting the need for additional staff to adequately cover security duties required in federal regulation. Nearly all costs are reimbursable to PGE through the DOE settlement claim for the Trojan ISFSI." | ! *Id.* at Exhibit 702, page 1 | |
| | ! See also Exhibit 204 of Testimony, listing an amortized value of costs from the "Trojan Spent Fuel Settlement" of -$16,800,000 in 2015, -$16,340,000 in 2016, and -$17,312,000 in 2017. | ! *See id.*, Direct Testimony of Alex Tooman and Rebecca Brown, Exhibit 204. | |

| Plant | Description of Costs Recovered | Source | Enclosure No. |
|---|---|---|---|
| SONGS Units 1, 2, & 3 – DOE Round 1 | ! "The Court concludes that plaintiff is entitled to a total of $142,394,294 in damages, broken down roughly into the following categories: (1) approximately $92 million for construction and operation of an on-site dry storage facility, or Independent Spent Fuel Storage Installation (ISFSI) for each of its reactors; (2) approximately $23.6 million for overhead allocated to the ISFSI project; and (3) $26.8 million in expenses incurred storing SNF off-site." | ! *S. Cal. Edison Co. v. United States*, 93 Fed. Cl. 337, 340 (2010), *aff'd* 655 F.3d. 1319 (Fed. Cir. 2011) | 2 |
| | ! "Loosely broken down, the damages fall into the following categories:<br>o Costs of constructing and operating the on-site dry storage facility or ISFSI ($61,981,761 for SONGS Unit 1 and $35,551,467 for SONGS Unit 2);<br>o Various types of overhead allocated to the ISFSI project ($19,544,212 for SONGS Unit 1 and $4,113,579 for SONGS Unit 2);<br>o Off-site storage of SNF at the GE Morris facility ($26,827,548) . . . ." | ! *Id.* at 346; *see also* 371 (Table listing amounts recovered) | |

| Plant | Description of Costs Recovered | Source | Enclosure No. |
|---|---|---|---|
| SONGS Units 1, 2, & 3 – DOE Round 2 | ! "Table II-1 below provides the DOE Spent Fuel Litigation – Round 2 proceeds broken out by SONGS unit and cost category"<br>o Table II lists the categories of costs as<br>▪ SONGS Unit 1 ISFSI Costs<br>▪ Capital<br>▪ GE Morris Storage<br>▪ SONGS Units 2 and 3 ISFSI Costs<br>▪ Capital<br>▪ Fuel Moves (O&M) | ! Supplemental Direct Testimony of Southern California Edison, Application A.16-04-001, Exhibit SCE-05, at 4-5(June 29, 2016) | 3 |
| Yankee Electric Companies (Maine Yankee, Connecticut Yankee, Yankee Row) | ! "The government specifically objects only to the following categories of damages: (1) the costs to plaintiffs of administering their health and welfare plans, (2) the distribution of settlement proceeds from the Stone & Webster Engineering Corporation ("SWEC") litigation, (3) costs associated with transfer of the property on which the nuclear plants were situated, and (4) the legal and tax expenses related to the recovery of damages from the first round of this litigation."<br>! "The starting point for these calculations are the storage facility costs, or 'ISFSI Operational Costs' for each utility during the claim period. . . . The operation costs include: full and part-time employees, security costs, contracted labor for temporary or special projects, taxes, insurance, utility costs, materials and supplies, and other miscellaneous expenses." | ! *Yankee Atomic Elec. Co. v. United States*, 125 Fed. Cl. 641, 645 (2016)<br>! *Id.*; *see also id.* at 646 (tables listing total costs), 658 (tables showing actual damages awarded) | 4 |

| Plant | Description of Costs Recovered | Source | Enclosure No. |
|---|---|---|---|
| Rancho Seco | ! "The court found that SMUD was entitled to recover costs for:<br>o Dry storage of SNF,<br>. . .<br>o Operation and maintenance of the ISFSI"<br>! "In this case, SMUD seeks $29,549,558 in damages . . . The government objects only to $7,041,215 of that amount."<br>! "[T]he court has determined that SMUD is entitled to $28,867,161 in damages to mitigate the Government's partial breach of the Standard Contract from January 1, 2010 to June 30, 2015." | ! *Sacramento Mun. Util. Dist. v. United States*, 130 Fed. Cl. 735, 741-742 (2017) (citing *Sacramento Mun. Util. Dist. v. United States*, 63 Fed. Cl. 495, 502-03 (2005))<br>! *Id.* at 747<br>! *Id.* at 761 | 5 |

# ENCLOSURE 1

**BEFORE THE PUBLIC UTILITY COMMISSION**

**OF THE STATE OF OREGON**

# UE 319

# Policy

**PORTLAND GENERAL ELECTRIC COMPANY**

**Direct Testimony and Exhibits of**

***Jim Piro***
***Jim Lobdell***

**February 28, 2017**

**PGE Exhibit 204**
**Amortization Detail**
**2014 - 2018 Test Year**
($000)

| Item | FERC Account | AWO | (1) 2014 Actuals | (2) 2015 Actuals | (3) 2016 Actuals | (4) 2017 Forecast | (5) 2017 Forecast used for 2018 Test Year |
|---|---|---|---|---|---|---|---|
| Software Amortization (Intangible) | 404.0 | | 22,237 | 30,053 | 35,668 | 46,999 | 46,999 |
| Other Intangible Plant (Includes Hydro Relicensing) | 404.0 | | 3,163 | 8,312 | 8,430 | 9,294 | 9,294 |
| Trojan Decommissioning | 407.0 | 7000000045 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| Trojan Spent fuel Settlement | 407.0 | 3000000786 | 0 | (16,800) | (16,340) | (17,312) | 0 |
| Independant Evaluator Deferral | 407.3 | | 20 | 547 | 35 | 0 | 0 |
| Colstrip Common FERC Adjustment | 407.3 | 7000000107 | 322 | 322 | 322 | 107 | 107 |
| Schedule 110 EE Asset Balancing Acccount | 407.3 | 7000000124 | 921 | 902 | 884 | 942 | 942 |
| AMI Project Office Costs | 407.3 | | 0 | 0 | 0 | 0 | 0 |
| Fit Pilot Program | 407.3 | 7000002001 | 5,051 | 6,248 | 7,975 | 7,740 | 7,740 |
| Regulatory Deferral Amortz | 407.3 | 7000010741 | 15,978 | 18,959 | 155 | 0 | 0 |
| Residual Balance | 407.3 | | 0 | 0 | 0 | 0 | 0 |
| Regulatory Deferral (capital Deferral) | 407.4 | 7000010741 | 13 | 0 | 0 | 0 | 0 |
| 2011 Local 408/MCBIT Deferral | 407.4 | 3000000135 | (180) | 168 | 515 | (440) | (200) |
| Int Income PES Note | 407.4 | 7000000319 | 0 | 0 | 0 | 0 | 0 |
| ISFSI Tax Credits-Used | 407.4 | 7000000324 | 0 | (5,290) | (300) | 0 | 0 |
| SunWay 3 | 407.4 | 7000000727 | (45) | (45) | (45) | 0 | 0 |
| | | | 50,979 | 46,875 | 40,798 | 50,831 | 68,383 |
| Allocated to retail | | | | | | | (47) |
| **Total Amortization** | | | **50,979** | **46,875** | **40,798** | **50,831** | **68,336** |

**BEFORE THE PUBLIC UTILITY COMMISSION**

**OF THE STATE OF OREGON**

# UE 319

# Production O&M

**PORTLAND GENERAL ELECTRIC COMPANY**

**Direct Testimony and Exhibits of**

***Bradley Jenkins***
***Aaron Rodehorst***

**February 28, 2017**

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# I. Introduction

**Q. Please state your names and positions with Portland General Electric (PGE).**

A. My name is Bradley Jenkins. My position at PGE is Vice President, Power Supply Generation. I am responsible for all aspects of PGE's Power Supply Generation. My qualifications are included at the end of this testimony.

My name is Aaron Rodehorst. My position at PGE is Senior Analyst, Regulatory Affairs. My qualifications are included at the end of PGE Exhibit 300.

**Q. What is the purpose of your testimony?**

A. The purpose of our testimony is to support the operations and maintenance (O&M) expenses associated with PGE's long-term power supply resources. We discuss the recent plant performance of our Generation fleet. We also identify and discuss the major drivers of the 2018 test year O&M expenses related to PGE's generating plant operations as compared to actual 2016 O&M expenses.

**Q. What are PGE's goals for plant operations and maintenance?**

A. Our primary goals for plant-related activities are to manage our Generation plants in a safe, reliable, and economically competitive manner while maintaining compliance with all local, state, and federal regulations, permits, licenses, and environmental standards. We achieve these goals by implementing prudent and timely maintenance practices, establishing effective safety and reliability initiatives, and making necessary investments in our Generation plants.

**Q. How is the remainder of your testimony organized?**

A. Our testimony has four additional sections. In Section II, we discuss PGE's Generation resources and their recent performance. In Section III, we discuss our forecast of 2018 test year Generation O&M expenses. We then summarize our request in this filing in Section IV and present Mr. Jenkins' qualifications in Section V.

# II. PGE's Generation Resources

## A. Generation Resources

**Q. Have you prepared an exhibit that identifies all of PGE's power supply resources for the 2018 test year?**

A. Yes. Confidential PGE Exhibit 701 lists PGE's generating resources and their expected average energy output as modeled under normal hydro conditions for PGE's initial 2018 Net Variable Power Cost (NVPC) forecast.[1]

**Q. Have PGE's long-term power supply resources changed significantly since the UE 294 general rate case?**

A. Yes. In Order No. 15-356, Docket No. UE 294, the Public Utility Commission of Oregon approved the addition of the Carty Generating Station (Carty) in customer prices, if placed into service by July 31, 2016. PGE met that deadline when Carty went into service on July 29, 2016.

## B. Plant Performance

**Q. What are PGE's goals for Generation plant performance?**

A. The performance and availability of PGE's generating resources are top priorities for the Generation organization. As a long-term goal, we target plant performance and availability in the top quartile of an industry peer group. On a year-to-year basis, realized plant availability is a key factor in evaluating the Generation organization.

**Q. How have PGE's thermal plants performed in 2015 and 2016?**

A. In 2015, the majority of PGE's thermal plants experienced no major forced outages and exhibited high availability. Thermal Generation was higher than normal for most of our

[1] Discussed in PGE Exhibit 300

thermal plants due to low natural gas prices and the timing of hydro availability. Because of a warm spring in 2015, runoff came earlier than normal and did not coincide with the summer peak, requiring increased dispatch of thermal facilities to meet loads.

In 2016, the majority of PGE's thermal plants continued to perform very well, experienced no major forced outages, and maintained a high availability. Similar to 2015, we had mild winter and spring temperatures at the beginning of the year causing the economic displacement of the Boardman generating plant. Towards the end of 2016, high amounts of rain led to increased hydro availability displacing the majority of our thermal resources.

Confidential PGE Exhibit 704 provides historical 2013 through 2016 thermal plant availability and forced outage rates reported quarterly by PGE to the North American Electric Reliability Corporation (NERC), and finalized annually.[2]

**Q. Were there any exceptions in 2015 and 2016?**

A. Yes, just one plant. Beaver generating plant's forced outage rate is higher in 2015 and 2016 due to unplanned maintenance work:

- In 2015, Unit 3 had an unplanned hot gas path inspection following a routine inspection, Unit 6 experienced excessive internal oil leaks requiring immediate troubleshooting and repair, and Unit 7 (steam turbine) had excessive vibration on the generator requiring disassembly and repair of the end blocking of the rotor windings.
- In 2016, Unit 2's Major Inspection was extended due to discovery work identified during repairs creating an unplanned outage extension, Unit 7 (steam turbine)

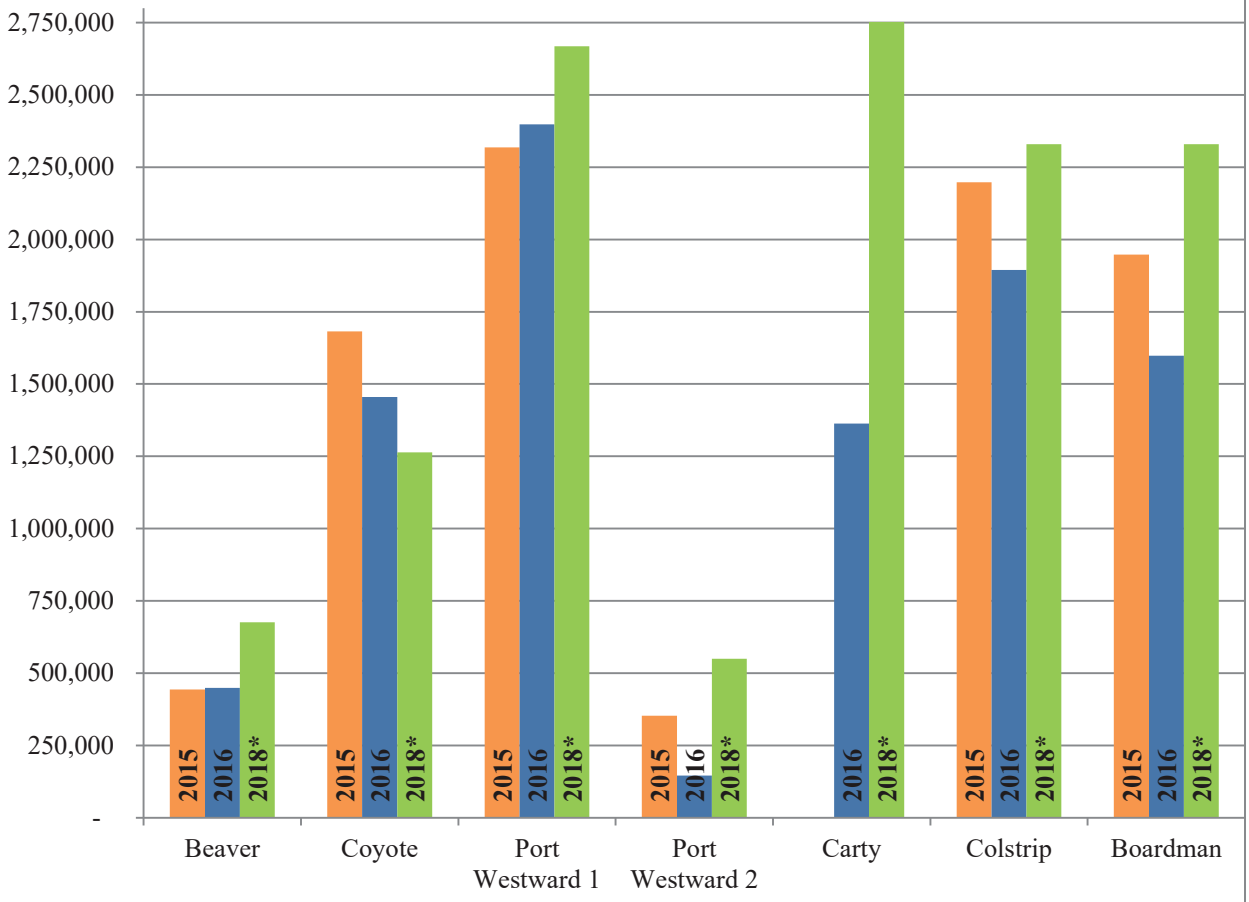
[2] Forced Outage Rates reported to NERC are not equivalent to the forced outage rate methodology applied in PGE's Net Variable Power Cost (NVPC) forecast. See PGE's Minimum Filing Requirements included as part of PGE's NVPC forecast for details on the forced outage rate methodology employed in MONET.

experienced vibration issues requiring a rebalancing, and Unit 8 was forced out most of the year due to compressor damage and evaluation of repairs.

**Q. How does the 2018 expected Generation for PGE's thermal resources compare to previous years?**

A. Figure 1 below summarizes actual thermal Generation for 2015 and 2016, and PGE's current 2018 forecast for each of our existing thermal resources. Thermal Generation is expected to increase for our thermal resources in 2018 relative to 2016, primarily due to weather normalization and forecasted low fuel prices, which we expect to contribute to increased dispatch. PGE Exhibit 300 presents our 2018 NVPC forecast.

## Figure 1: PGE Thermal Resource Generation (MWh)




Data Source:
*2018 based on initial NVPC forecast presented with this filing
2016 based on the 2016 EGR&D YTD Report presented in Docket No. UM 1294 (Monthly Power Cost Report)

# III. Generation Plant O&M

## A. Generation Plant O&M Expenses

**Q. What are the changes in PGE's plant O&M between 2016 and 2018?**

A. Table 1 below summarizes the changes in total Generation Plant O&M expenses. These amounts include adjustments for emissions control chemical costs.

**Table 1**
**Generation Plant O&M Summary**
**($millions)***

| O&M Expenses | 2016 Actuals | 2018 Test Year | Delta | Annual % Change |
|---|---|---|---|---|
| Labor | $39.4 | $43.3 | $3.9 | 4.8% |
| Non-Labor | $81.5 | $85.6 | $4.1 | 2.5% |
| Major Maintenance Accruals | $12.1 | $16.3 | $4.2 | 16.0% |
| Subtotal | $133.0 | $145.1 | $12.1 | 4.5% |
| Information Technology (IT) | $12.4 | $14.6 | $2.3 | 8.7% |
| **Total** | **$145.4** | **$159.8** | **$14.4** | **4.8%** |

**May not sum due to rounding.*

**Q. How do labor and non-labor plant O&M expenses change from 2016 to 2018?**

A. Labor-related plant O&M is projected to increase by approximately $3.9 million. This increase is due to labor cost escalation (discussed in PGE Exhibit 400) and an increase to the number of Full Time Equivalent employees (FTEs) discussed below. Non-Labor related plant O&M, including the Major Maintenance Accruals (MMA), is projected to increase by approximately $8.3 million. The major drivers of these increases are summarized in Section B below.

**Q. What do IT costs represent?**

A. IT costs represent expenses that are directly assigned and allocated to Generation and that relate to PGE's efforts to develop, operate, and maintain our computer, information, cyber, and communication systems. IT costs are allocated to all operating areas of the company and discussed in detail in PGE Exhibit 500.

## B. Generation Plant O&M Expense Major Drivers

*1. Non-Labor O&M Expenses*

**Q. What are the major drivers to non-labor O&M expenses?**

A. The major drivers to non-labor O&M expenses are: 1) the increase in Carty O&M expenses, 2) updates to PGE's Major Maintenance Accruals, and 3) non-labor cost escalations.

**Q. Please explain the increase in Carty O&M expenses.**

A. Carty O&M expenses are estimated to increase by approximately $0.9 million due to the plant being operational for the full year 2018. In 2016, Carty began operations on July 29. Customer prices, however, already reflect Carty's full year budget in accordance with Commission Order No. 15-356.

**Q. Please explain the increase in Major Maintenance Accrual (MMA) expenses.**

A. PGE's MMA benefits to customers, calculation methodology, and expenses are discussed in detail in Section C below.

**Q. What is the increase in non-labor O&M expenses due to non-labor cost escalations?**

A. Non-labor O&M expenses are forecasted to increase by approximately $3.1 million in the 2018 test year due to non-labor cost escalations. For non-labor costs, we use escalation rates ranging from 1.66% to 3.11% from *Global Insights, Economic Outlook* dated August 2016. Non-labor cost escalation rates are presented in PGE Exhibit 200.

*2. Labor O&M Expenses*

**Q. What is the change in Generation related FTEs from 2016 to 2018?**

A. The projected increase in FTEs is approximately thirty-two across Generation.

**Q. What are the main drivers for the increase in Generation-related FTEs?**

A. The main drivers of the increase in Generation-related FTEs between 2016 and 2018 are as follows:

- Ten Power Supply Engineering Services (PSES) FTEs. These FTEs will 1) support increasing regulatory requirements, 2) work on PGE's aging assets requiring upgrades and/or replacement, and increased engineering support to maintain aging infrastructure, 3) develop expanded technical expertise needed as new forms of generation are added and control systems are modernized, and 4) ensure that PGE maintains a strong cyber security program. It is important for PGE to fill these positions in 2017 and 2018 to ensure that PGE's capital investments are utilized in an effective and beneficial manner and to allow PSES to properly manage the workload necessary to meet regulatory compliance and cyber security best practices.
- Four Resource Planning FTEs. These FTEs will provide increased support for strategic projects, Renewable Portfolios, and Integrated Resource Planning (IRP). If Resource Planning does not fill these positions, the impacts include, but are not limited to, reduced productivity and quality, long delays in regulatory processes, and reduced opportunity for stakeholder involvement.
- Three Trojan FTEs. These FTEs will support increased Trojan security per Nuclear Regulatory Commission (NRC) Security requirements. PGE is working with the NRC to implement a security staffing that meets their recommendations and industry standards. The NRC has recently completed its assessment of our plan and its conclusions are being disseminated. As a result of the timing, actual staffing may differ from the one submitted for the OPUC review in our 2018 general rate case filing. Nearly all costs associated with these FTEs are reimbursable to PGE through

the settlement claim with the Department of Energy for the Trojan Independent Spent Fuel Storage Installation, approved by the U.S. Court of Federal Claims on July 18, 2013.

- Three Environmental and Licensing Services FTEs. These FTEs will support the increased demands of regulatory compliance, FERC license implementation requirements, and increased outreach requirements related to our fisheries program per the Pelton-Round Butte Fish Committee recommendation.
- Twelve Generation plant and Power Operation FTEs. These FTEs will increase the number of operating crews at Port Westward and support Generation projects, PGE's participation in the Western Energy Imbalance Market (EIM)[3] starting in 2017, and increased plant operations and maintenance for Carty, Pelton-Round Butte, and Beaver.

Additional detail by FTE is provided in PGE Exhibit 702.

**Q. Please summarize the FTEs requested for PSES.**

A. PSES provides civil, electrical, mechanical engineering, and survey services to PGE's generating plants and related departments. PSES also provides various forms of administrative support, such as records management, drawing control, and project design. As a result of adding new assets (Port Westward II in 2015 and Carty in 2016), continually expanding cyber security, regulatory and reporting requirements, and aging Generation resources, PSES requires six additional FTEs for administrative, engineering, and analyst positions. Four additional FTEs result from the reorganization of surveyors from Property

[3] Discussed in PGE Exhibit 300, Section III, Part C

Services to PSES in the middle of 2016 and the transfer of an Admin Specialist from Hydro Operations to PSES in 2018.[4]

**Q. Please summarize the position additions in Resource Planning.**

A. The IRP process has materially changed from a cyclical process to one that requires an ongoing level of support. In the past the process was cyclical and involved a two-year planning cycle, in which heavy analysis and documentation was completed in the first year, followed by a less intense stakeholder review process in the second year. The emergence of variable energy in increasing quantities and the portfolio effects between all resources have created new challenges for resource planning and system operators. As a result, the IRP process has evolved to incorporate new resource types, characteristics, and relationships. PGE must increase staffing to be able to keep pace with the complexity of the analysis, communicate information to stakeholders, maintain continuity, and ensure appropriate individual workloads.

**Q. Please summarize the remaining FTE additions in Generation.**

A. The remaining additional FTEs relate to increased environmental regulatory compliance and license implementation requirements, generating plant operation support, other compliance requirements (e.g., Trojan Independent Spent Fuel Storage Installation), and PGE's participation in the Western EIM. As noted above, detailed information by FTE is provided in PGE Exhibit 702.

[4] The four FTEs transferred from Property Services and Hydro Operations represent a net zero FTE impact company wide and will have no incremental costs to customers.

## C. Major Maintenance Accruals

**Q. Please explain the major maintenance accrual (MMA) included in fixed O&M costs.**

A. Major maintenance costs can vary dramatically from year to year and, absent an MMA, PGE would expense the major maintenance costs in the period the work is performed. Accounting for costs in this manner has two significant drawbacks: 1) it does not allow the recording of expense in the same period the benefits[5] occur; and 2) it results in an expense that is cyclical and "lumpy" over the years. Due to this, it can be problematic to establish stable prices. To avoid these problems, the Commission approved in Docket No. UE 93 (Order No. 95-1216) an accrual and balancing account treatment for major maintenance costs.[6] The major maintenance accrual is based on a multiple-year forecast of major maintenance activities with an accrual estimate designed to bring the balancing account to zero at the end of the multiple-year period. By balancing the costs and collections, PGE achieves an appropriate matching of costs to both the period and customers benefitted. The accrual also results in a better matching of costs with revenue, without requiring PGE to file a rate case every year to capture the swings in major maintenance costs.

**Q. How does the MMA benefit customers?**

A. Properly matching the major maintenance expense to the period of operation benefits customers by reducing intergenerational inequities in prices to customers. In addition, normalizing the costs reduces the frequency of rate changes because it eliminates the need to

[5] The benefits are the generation and use of electricity by customers
[6] Order No. 95-1216 approved an MMA for Coyote Springs. Subsequent Commission orders approving MMAs include: PW1 (UE 262, OPUC Order No. 13-459), PW 2 (UE 283, OPUC Order No. 14-422), and Carty (UE 294, OPUC Order No. 15-356)

file nearly annual rate cases or deferred accounting applications to capture the significant increases or decreases in major maintenance costs.

**Q. What items are included in the MMA?**

A. Major maintenance events occur based upon maintenance intervals established under the company's plant maintenance contracts. Generally, the timing is dependent upon a facility's capacity factor (hours run / hours in period). Listed below are examples of natural gas Generation plants' major maintenance items:

- Major Turbine and Generator Inspections to perform advanced assessments, along with related work that may include combustion turbine alignment, exhaust frame modifications, repairs to thrust bearings, the generator stator and the generator field.
- Hot Gas Path Inspection including the disassembly of combustion and turbine sections of the combustion turbine so that parts may be inspected, and repaired or replaced as necessary. The combustion section is where the natural gas is combined with compressed air and burned. The turbine section is where mechanical energy is extracted from the high speed flow of hot combustion gases exiting the combustion chambers.
- SR Catalyst Replacements.
- Auxiliary Boiler Maintenance.

**Q. How does PGE calculate the MMA?**

A. We forecast five years of the expected operational run of our thermal plants using the MONET model and, based on hours of plant operation, we forecast the timing for the major maintenance activities. The total maintenance costs over the five year period are averaged to obtain the annual major maintenance expense.

**Q. For which thermal plants are MMAs included in the 2018 test year plant O&M costs.**

A. For the test year 2018 PGE will continue to have MMAs for Port Westward 1 and 2, Coyote Springs, and Carty. In addition to these, PGE is proposing an MMA for the Colstrip generating plant.

**Q. Please explain PGE's proposal to create an MMA for Colstrip.**

A. Colstrip Units 3 and 4 operate on a three-year maintenance outage schedule. This creates a pattern where maintenance outages occur in two of every three years leading to large variances in costs from one year to another. To address the cyclical and "lumpy" nature of these costs and for the other reasons discussed above we propose creating an MMA for Colstrip.

**Q. What is the cost impact of creating an MMA for Colstrip?**

A. Creating an MMA for Colstrip would increase the forecasted total MMA amount for the 2018 test year by approximately $2.3 million. However, we propose reducing the MMA amounts for our other thermal plants in the 2018 test year such that the net increase in total MMA after adding Colstrip would be less, or approximately $1.0 million.

**Q. What is the total MMA amount included in the 2018 test year plant O&M costs?**

A. The 2018 test year total forecasted MMA expense is $16.3 million, increasing by $4.7 million over 2016 actuals. The major drivers for this variance are the $2.7 million increase in the Carty MMA due to having the plant operational for a full-year in 2018 and the $2.3 million increase due to adding the Colstrip MMA. Similar to Carty non-labor O&M expenses, the increase in the Carty MMA has a minimal actual cost impact to customers because Carty's full annualized budget was placed in rates in accordance with Commission Order 15-356 (UE 294). Based on the current level of the balancing accounts for the MMAs

and the latest five-year forecast for Coyote Springs and Port Westward 2 we reduced the annual accrual amounts by approximately $0.9 million, partly offsetting the increase due to adding the Colstrip MMA. Major maintenance accrual calculations are presented in PGE Exhibit 703.

# IV. Conclusion

**Q. Please summarize your request for Production O&M in this filing.**

A. We request that the Public Utility Commission of Oregon approve PGE's forecast of $159.8 million in Production O&M costs in the 2018 test year. This represents a $14.4 million increase from 2016 costs due primarily to non-labor costs escalations, increases in plant and power operations O&M expenses, and labor O&M expenses.

# V. Qualifications

**Q. Mr. Jenkins, please describe your qualifications.**

A. I hold a Bachelor of Science degree in Industrial Engineering from Southern Illinois University and have over 25 years of nuclear and thermal Generation plant experience in operations, maintenance, refueling, and construction. I am a certified Project Management Professional and have worked for Entergy, Energy Northwest and contracted with Tennessee Valley Authority (TVA). I joined Portland General Electric (PGE) in 2012 as Operations Manager at the Boardman coal plant and became the plant manager in 2013. I was promoted to General Manager, Diversified Plant Operations in 2014, overseeing all of PGE's thermal and renewable assets in eastern Oregon and Washington. I was appointed Vice President of Power Supply Generation in September of 2015. Today, I am responsible for over 3000 MWs of wind, solar, hydro, and thermal Generation at 15 Generation facilities, as well as the Trojan Independent Spent Fuel Storage Installation. I am also an Air Force veteran with 9 years of military experience as a Systems Analyst.

**Q. Does this conclude your testimony?**

A. Yes.

# List of Exhibits

| PGE Exhibit | Description |
|---|---|
| 701C | PGE Generating Resource Summary |
| 702 | PGE Full Time Employees Descriptions |
| 703 | PGE Major Maintenance Accrual Calculations |
| 704C | PGE Thermal Plant Forced Outage Rate and Availability 2013-2016 |

# EXHIBIT 701C

# Confidential

| Dept. | Dept. Description | Description | Basis for Position(s) | FTE |
|---|---|---|---|---|
| **GENERATION** | | | | **32.0** |
| 16 | Power Operations | Energy Market Settlement Analyst | PGE will join the Western Energy Imbalance Market in the latter half of 2017 and the Market Operator will be sending PGE large settlement files on a frequent basis. Two additional FTEs are required to perform this work. | 2.0 |
| 16 | Power Operations | Energy Market Policy Analyst | Required to monitor the policy and rule changes implemented by the Western Energy Imbalance Market. The position will be needed early in 2017 to assist Market Trials prior to live participation in the Western Energy Imbalance Market in the latter half of 2017. | 1.0 |
| 62 | Trojan | Independent Spent Fuel Storage Installation (ISFSI) Technician | Required to perform security, operating, maintenance, and administrative functions at the Trojan ISFSI. The ISFSI technicians will report to the ISFSI Supervisor and are responsible for the safe storage of spent nuclear fuel from the Trojan Nuclear Plant. The ISFSI technicians are being added in response to recent NRC Security Inspector comments highlighting the need for additional staff to adequately cover security duties required in federal regulation. Nearly all costs are reimbursable to PGE through the DOE settlement claim for the Trojan ISFSI. | 3.0 |
| 86 | Port Westward 2 | Generation Technician | Required to support progression from four to five operating crews and maintenance. Having the additional FTEs will also reduce the use of contractors during PW2 annual outages. | 3.0 |
| 88 | Carty | Generation Technician | To better align gas plants, a planner scheduler was added to all gas plants in 2015. That 1 FTE count was not added to Carty total head count resulting in Carty being one Generation Technician short. Adding this FTE is required to ensure that plant operations and maintenance are being done in an effective and efficient manner. | 1.0 |
| 161 | Pelton-Round Butte | Maintenance Supervisor | Pelton Round Butte operation and dispatch changed significantly over the past 5 to 10 years with the plant being cycled more frequently and seemingly relied upon more for ancillary services as opposed to primarily being base loaded in the past. This position is required to manage critical asset maintenance and coordinate maintenance support and outage planning services in support of plant operations. | 1.0 |
| Various | Beaver | Temporary Hourly Positions | Required to reduce overtime and are partially offset by savings from this reduction. Although the three temporary hourly positions appear to be an increase, this is because PGE opted to contract out the work these positions would have done in 2016. As such, 2016 outside services is over budget while temporary labor is under budget. PGE continues to expect to need this support and has budgeted three FTEs for 2018. | 3.0 |
| 551 | Power Supply Engineering Svcs | Surveyors | Reorganization of surveyors from Property Services to PSES in the middle of 2016. FTE impact is a net zero change company wide and will have no incremental cost to customers. | 3.0 |

| | | | | |
|---|---|---|---|---|
| 551 | Power Supply Engineering Svcs | Cyber Security Engineer | With the additional and existing Industrial Control System (ICS) generation assets (i.e. assets that run plant generators), the ever increasing workload will require a deeper level of cyber security engineering support. The cyber engineer position is required to ensure PGE generation sites are able to respond to the ever changing cyber security threats. Each engineer is working to balance operational requirements with defending our current technologies from cyber-attacks. | 1.0 |
| 551 | Power Supply Engineering Svcs | Cyber Security Analyst | With the current cyber-attack rate at existing and future industrial Control System (ICS) generation assets, PGE has implemented capital projects associated with a Network Intrusion Detection System (NIDS). These recent software and hardware investments require an analyst position to tune and develop the NDIS system to ensure all PGE generation sites have proper protocols to respond to cyber-attacks. | 1.0 |
| 551 | Power Supply Engineering Svcs | Compliance Specialist | Required to assist in understanding, interpreting, communicating, and implementing PGE compliance with North American Reliability Corporation (NERC) and Western Electric Coordinating Council (WECC) regulatory standards. | 1.0 |
| 551 | Power Supply Engineering Svcs | Analyst | Required for additional support of PGE's new Reliability, Performance, and Monitoring (RPM) Center initiated in 2016. The RPM Center brings in house the plant and asset performance monitoring historically provided by General Electric's "Smart Signal" service. Additionally, the RPM Center will provide an extra level of vigilance as PGE begins more frequent cycling of generating plants. | 1.0 |
| 551 | Power Supply Engineering Svcs | IT Analyst | Will function as a dedicated generation resource for resolving IT issues at Generation facilities. With the ever expanding role of IT based systems at PGE, a dedicated resource is required to ensure that issues at remote Generation facilities are addressed in a timely manner. | 1.0 |
| 551 | Power Supply Engineering Svcs | Admin Specialist | transfer from Hydro Operations. FTE impact is a net zero change and will have no incremental cost to customers. | 1.0 |
| 551 | Power Supply Engineering Svcs | Technical Writer Specialist | Required to assist with the development and maintenance of over 200 generation procedures, including Generation Fleet, Environmental, Cyber Security, Compliance, Reliability, and plant specific procedures. | 1.0 |
| 554 | Generation Projects | Project Manager / Senior Project Engineer | Required to provide expertise for engineering reviews, project coordination, and project management. The Generation Project department is planning for the next five years while continuing to support current projects, intracompany requests for support of projects, and evaluation of new and evolving technologies to support future projects. In analyzing the timeline of the current IRP, currently proposed renewable RFP, and future RFPs, and the timeframe to develop new supply- and demand-side resources, Generation Projects has identified a gap in staffing that threatens the ability of the group to successfully deliver complex and strategic for our customers. | 1.0 |

| | | | | |
|---|---|---|---|---|
| | Integrated Resource Planning | Analyst | Required to provide strategic and technical analysis, including economic evaluations or resource options needed to meet the electric energy needs of PGE customers. They will also provide analysis to support recommendation regarding several regulatory processes, including, but not limited to, the IRP and Competitive Bidding (RFP). With the increased workload due to the emergence of variable energy in increasing quantities and the portfolio effects between all resources, current employees are consistently working more than 40 hours per week affecting the work quality and significantly increasing the risk for mistakes. Additionally, important work is being deferred or dropped due to lack of bandwidth to complete critical tasks.<br>Several options to fill the business needs, minimize impacts and overcome the challenges were evaluated, including contractors, sunset positions, cross-training, and long-term temporary positions. None provide the necessary support to maintain quality and efficiency over the long term. | 3.0 |
| 556 | Integrated Resource Planning | Project Manager | Required to facilitate management and coordination for the models to support evaluation of technologies, locational deployment and use cases for all resources, as well as development of the documentation and materials necessary to transparently communicate the information produced through the IRP and related process.<br>Several options to fill the business needs, minimize impacts and overcome the challenges were evaluated, including contractors, sunset positions, cross-training, and long-term temporary positions. None provide the necessary support to maintain quality and efficiency over the long term. | 1.0 |
| 841 | Environmental and Licensing Services | Project Controls and Compliance Specialist | Required to develop, implement, research, and support project control for PGE's environmental projects, ensure their implementation in an economical manner, and coordinate compliance, communication and interaction among various PGE departments and groups. The position will also develop department budgeting and staffing strategy and schedules based on projected projects going through funding process. | 1.0 |
| 842 | Eastside Biological Services | Technician, Environmental Communication | The Pelton-Round Butte Fish Committee, comprised of 22 state and federal agencies and NGOs have raised concerns about the growing outreach needs related to our fisheries program, and that current staffing isn't sufficient to meet that without affecting the biological program. Currently there is an active adversarial group, the Deschutes River Alliance (DRA) on the Deschutes River that opposes the Pelton Round Butte fisheries and water quality program. DRA is currently suing PGE under the Clean Water Act. The DRA has a very active and effective public relations campaign. PGE's communication/PR hasn't been sufficient given the increased negative campaigning. This position was created to provide a dedicated person, located on the Eastside, to increase our outreach efforts in the community. Before this, the Eastside Biological staff tried to fill the gap, but this increased workload was interfering with their ability to complete FERC required tasks. The risk of not providing increased outreach is that DRA's influence would grow, adding other NGOs and community members to their supporters threatening PGE's investment in the Selective Water Withdrawal fish collection facility. | 1.0 |

| | | | | |
|---|---|---|---|---|
| 844 | Environmental Compliance and Licensing | Environmental Specialist | Required for multi-media environmental support for eastside non-hydro generation sites (Biglow Canyon, Boardman, Carty, Coyote Springs, Tucannon), with emphasis on air quality and waste management. Increased regulations and activities include coal combustions residuals, ODEQ changes to air quality permitting, and general environmental support for generation facilities. | 1.0 |

**Exhibit 703 is voluminous in size,**
**provided in electronic format only**

# EXHIBIT 704C

# Confidential

**BEFORE THE PUBLIC UTILITY COMMISSION**

**OF THE STATE OF OREGON**

# UE 319

# Transmission and Distribution O&M

**PORTLAND GENERAL ELECTRIC COMPANY**

**Direct Testimony and Exhibits of**

***Bill Nicholson***
***Larry Bekkedahl***

**February 28, 2017**

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# I. Introduction

**Q. Please state your names and positions with Portland General Electric.**

A. My name is Bill Nicholson. I am Senior Vice President of Customer Service and Transmission and Distribution.

My name is Larry Bekkedahl. I am Vice President of Transmission and Distribution.

Our qualifications are included at the end of this testimony.

**Q. What is the purpose of your testimony?**

A. The purpose of our testimony is to explain our increasing capital spending reflected in Portland General Electric's (PGE) 2018 test year. This additional spending will allow us to accommodate increased customer demand on the Transmission and Distribution (T&D) system, and maintain reliability and other system goals through the implementation of T&D asset management strategy. In addition, we also discuss T&D's operations and maintenance (O&M) costs for the 2018 test year, which includes a request to modify the current storm deferral to more effectively normalize storm restoration costs in PGE's prices.

**Q. What are T&D's primary goals?**

A. Our primary goals are to:

- Provide safe and reliable energy delivery services to our customers;
- Cultivate a corporate culture that improves employee and public safety;
- Enhance efficiency and increase customer value by deploying new techniques, technologies, industry best practices, and process improvements; and
- Ensure compliance with applicable regulations, including those addressing T&D grid reliability and operations.

**Q. How is the remainder of your testimony organized?**

A. The remainder of our testimony is organized into the following sections:

- Section II: Strategic Capital Improvements
- Section III: Transmission and Distribution Operations and Maintenance
- Section IV: Conclusion
- Section V: Qualifications

## II. Strategic Capital Improvements

**Q. Why is PGE planning to increase its capital investment in T&D?**

A. We are increasing our investments due to increasing customer-driven capital work and to improve the T&D system to keep it safe and reliable. In addition, we are 'strengthening' the power grid to better prepare for earthquakes, cyber-attacks, and other threats. We are also replacing or upgrading equipment nearing the end of its life and redesigning portions of the T&D system to improve reliability. All of these capital improvements are intended to meet mandates and goals related to the reliability, safety, environmental stewardship, and cost effectiveness of the T&D system.

**Q. What changes does PGE face in the T&D operating environment?**

A. The T&D organization faces many changes, including:

- Increasing reliability expectations of our customers;
- Increasing regulatory and compliance demands along with safety and environmental concerns;
- An aging asset fleet, which results in more reactive work to address service failures, as opposed to proactive management of system risk;
- Intensifying storms and storm response requirements;
- Increasing amount of customer work, due to a thriving economy. There is also a more complex construction environment, due to strong regional growth and tightening regulations (e.g., jurisdictional coordination and permitting challenges); and
- Employee retirements, which can result in a loss of institutional knowledge.

**Q. How will T&D address these changes?**

A. We are already addressing many of these changes by increasing labor resources and by developing a more robust and proactive T&D asset management strategy that:

- Directs capital spending where those investments more effectively support customer requirements and demands of the T&D system; and
- Matches overall spending and staff to customer needs.

**Q. What are the types of capital improvements?**

The capital improvements are in the following categories:

- Customer-driven capital work; this includes continuous improvement projects which are discussed later in our testimony.
- Strategic capital improvements for risk reduction in the T&D system; this includes PGE's Smart Grid initiatives.[1]
- Compliance with relevant regulations (i.e., National Electric Service Code [NESC] and North American Electric Reliability Corporation [NERC]); this applies to both customer-driven capital work and our strategic capital improvements for risk reduction.

### *A. Customer-Driven Capital Work*

**Q. What do you mean by customer-driven capital work?**

A. Customer-driven capital work refers to those capital investments that are a direct result of customers' requests (e.g., road widenings, new customer connections, and infrastructure improvements) and are needed as a result of our growing customer base.

**Q. What customer-driven work are you seeing as a result of the growing customer base?**

[1] See PGE's 2016 Smart Grid Report in OPUC Docket No. UM 1460 for details on Smart Grid initiatives.

A. We are seeing a continuing increase in new customer connections.

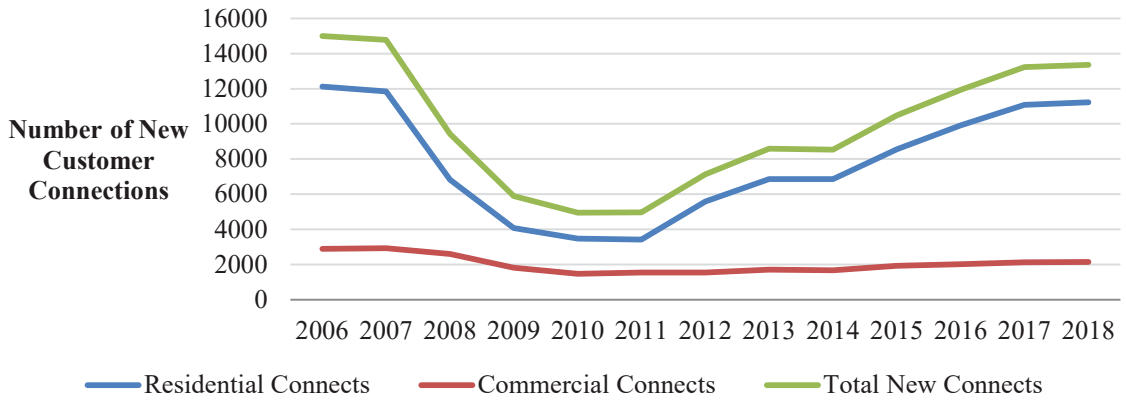
**Q. Please define new customer connections.**

A. New customer connections consist of new electrical infrastructure designed, engineered, and constructed to connect PGE's electrical system to industrial facilities, commercial buildings, or residential homes where no electrical service previously existed.

**Q. Please describe the growth of new customer connections.**

A. Growth in new customer connections generally follows economic expansion. The recent recession, beginning in December 2007, had a major impact on PGE's new customer connections. As seen below in Figure 1, new connections fell 66% from 2007 to 2011. Since the economy recovered, new customer connections grew rapidly, increasing by an annual rate of 20% from 2011 to 2016. From 2015 to 2016, new customer connections grew 14%.

**Figure 1**
**New Customer Connection Trend**




**Q. What is PGE's forecast for new customer connections?**

A. PGE forecasts continued growth of 12% from 2016 to 2018, to approximately 13,300 new connections. PGE Exhibit 1200 provides further details regarding customer growth.

# ENCLOSURE 2

KeyCite Yellow Flag - Negative Treatment
Disagreed With by Yankee Atomic Electric Company v. United States, Fed.Cl., November 14, 2013

Nuclear Reg. Rep. P 20,701
United States Court of Federal Claims.

SOUTHERN CALIFORNIA EDISON COMPANY, Plaintiff,
v.
The UNITED STATES of America, Defendant.

No. 04–0109C.
|
June 3, 2010.

**Synopsis**

**Background:** Nuclear utility sued United States, claiming damages of $146,349,316 as mitigation costs for Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of spent nuclear fuel (SNF) and high level waste (HLW) generated at utility's nuclear power plants.

**Holdings:** The Court of Federal Claims, Baskir, J., held that:

[1] utility was entitled to $92 million in direct costs for on-site dry storage facility;

[2] utility was entitled to $26.8 million for off-site storage;

[3] utility was entitled to $23.6 million in overhead for on-site dry storage project;

[4] investment costs in private fuel storage venture were not recoverable;

[5] financing costs for dry storage project were not recoverable;

[6] costs of storing Greater-Than-Class-C (GTCC) waste were not recoverable;

[7] offset of damages award was not required for so-called avoided costs; and

[8] offset of damages award was not required for failed fuel costs.

Ordered accordingly.

West Headnotes (20)

**[1] Damages**
Failure to Perform in General

In breach of contract cases the non-breaching party is entitled to damages sufficient to place it in as good a position as it would have been had the breaching party fully performed.

Cases that cite this headnote

**[2] Contracts**
Rights and Liabilities on Breach

**Damages**
Partial performance

Under a partial breach of contract scenario, the injured party elects to or is required to await the balance of the breaching party's performance under the contract, and brings an interim action to recover only those damages incurred to date.

Cases that cite this headnote

**[3] Public Contracts**
Breach of contract in general

**United States**
Breach of contract in general

The Nuclear Waste Policy Act (NWPA) precludes the Department of Energy (DOE) and nuclear utilities, as parties to standard contract requiring DOE to dispose of spent nuclear fuel (SNF) and high level waste (HLW) in exchange for utilities' payments into Nuclear Waste Fund, from treating the DOE's failure to dispose of SNF and HLW as a total breach, insofar as the DOE may not be discharged from the responsibility to dispose of SNF and HLW. Nuclear Waste Policy Act

of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

Cases that cite this headnote

[4] **Damages**
Natural and Probable Consequences of Breaches of Contract
**Damages**
Under circumstances within contemplation of parties
**Damages**
Breach of contract in general

It is the burden of the non-breaching party to establish that the particular damages claimed for breach of contract are recoverable by demonstrating: (1) the damages were reasonably foreseeable by the breaching party at the time the contract was entered into, (2) the breach is a substantial causal factor in the damages, and (3) damages can be shown with reasonable certainty.

1 Cases that cite this headnote

[5] **Public Contracts**
Presumptions and burden of proof
**United States**
Presumptions and burden of proof

The non-breaching party to a federal government contract can only recover for mitigation efforts if it is shown that these measures were incurred as a direct result of the government's breach, that is, causation, and assuming causation, the burden then shifts to the government to defend by affirmatively establishing that the mitigation was inappropriate or unreasonable.

1 Cases that cite this headnote

[6] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

In addition to the government's defenses of affirmatively establishing inappropriateness or unreasonableness of mitigation damages claimed by the non-breaching party to a federal government contract, the government may also show that the injured party has avoided certain expenses that it would have incurred in a non-breach scenario; under these circumstances, mitigation damages are offset by a corresponding amount in order to prevent a windfall to the non-breaching party.

1 Cases that cite this headnote

[7] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of utility's spent nuclear fuel (SNF) and high level waste (HLW), including Greater-Than-Class-C (GTCC) waste, directly caused utility's mitigation costs for temporary dry storage, since utility would have maintained full core reserve and sustained operations without need to resort to dry storage but for DOE's failure to dispose of waste. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

1 Cases that cite this headnote

[8] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of nuclear utility's spent nuclear fuel (SNF) and high level waste (HLW), entitled utility to approximately $92 million in mitigation damages as direct costs of constructing and operating on-site dry storage facility and manufacturing dry storage casks, since utility would have maintained full core reserve and sustained operations without need

to resort to dry storage but for DOE's failure to dispose of waste. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

1 Cases that cite this headnote

[9] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of nuclear utility's spent nuclear fuel (SNF) and high level waste (HLW), entitled utility to approximately $26.8 million in mitigation damages for costs of off-site storage, since utility would have arranged for delivery of waste to DOE but for DOE's breach that required utility to pay for off-site storage fees. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

Cases that cite this headnote

[10] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Reliability of nuclear utility's causation model, calculating mitigation costs for Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of nuclear utility's spent nuclear fuel (SNF) and high level waste (HLW), including Greater-Than-Class-C (GTCC) waste, was not impaired by absence of GTCC factored into DOE's SNF acceptance schedule for disposal, where GTCC represented only statistically insignificant amount of utility's entire inventory of SNF/HLW that would not have had appreciable effect on SNF queue awaiting disposal. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. §§ 61.55, 961.11.

1 Cases that cite this headnote

[11] **Damages**
Under circumstances within contemplation of parties

In the context of expectancy damages, any risk of uncertainty is assumed by the party whose wrongful conduct caused the damages.

1 Cases that cite this headnote

[12] **Damages**
Breach of contract in general

Where responsibility for damage from breach of contract is clear, it is not essential that the amount thereof be ascertainable with absolute exactness or mathematical precision; rather, it is enough if the evidence adduced is sufficient to enable the fact finder to make a fair and reasonable approximation.

1 Cases that cite this headnote

[13] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of nuclear utility's spent nuclear fuel (SNF) and high level waste (HLW), entitled utility to mitigation damages of $23.6 million in overhead allocated to dry storage project, since utility could have allocated resources, whether payroll services, insurance, or host of other general expenses representing cost of doing business, to other projects but for DOE's breach that required utility to construct and operate dry storage facility. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

2 Cases that cite this headnote

[14] **Public Contracts**

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Breach of contract in general

**United States**

Breach of contract in general

Nuclear utility's costs of investing in private fuel storage project, as speculative mitigation venture in which utility was equity partner, were not recoverable as mitigation damages for Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of utility's spent nuclear fuel (SNF) and high level waste (HLW), since utility's investment as equity partner, rather than as potential customer purchasing temporary storage in event of breach, reflected utility's profit motive based on possible financial gain from storing other utilities' radioactive waste, rather than merely seeking mitigation strategy for own waste disposal. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

Cases that cite this headnote

**[15] Damages**

Under circumstances within contemplation of parties

Plaintiff seeking damages for breach of contract must demonstrate that the magnitude and type of damages were foreseeable at the time that the parties entered into the contract.

Cases that cite this headnote

**[16] Public Contracts**

Breach of contract in general

**United States**

Breach of contract in general

Under no-interest rule, prohibiting government's liability for prejudgment interest absent waiver of sovereign immunity, nuclear utility was barred from recovering dry storage project financing costs, recorded for accounting purposes as allowance for funds used during construction (AFUDC), as alleged mitigation damages resulting from Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of utility's spent nuclear fuel (SNF) and high level waste (HLW), despite utility's claim that AFUDC was not interest on claim, but interest as claim, where utility issued generalized debt instruments to fund project, rather than specific loans directly traceable to project. 28 U.S.C.A. § 2516(a); Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

2 Cases that cite this headnote

**[17] Public Contracts**

Breach of contract in general

**United States**

Breach of contract in general

Nuclear utility's costs of on-site storage of Greater-Than-Class-C (GTCC) waste generated at power plant were not recoverable as mitigation damages for Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of utility's spent nuclear fuel (SNF) and high level waste (HLW), since DOE would not have accepted utility's one canister of GTCC for disposal during damages period. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

1 Cases that cite this headnote

**[18] Damages**

Mode of estimating damages in general

The injured party in a breach of contract case is not entitled, through the award of damages, to achieve a position superior to the one it would reasonably have occupied had the breach not occurred.

Cases that cite this headnote

**[19] Public Contracts**

Breach of contract in general

**United States**

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Breach of contract in general

Nuclear utility's costs of production of dry storage casks for spent nuclear fuel (SNF), cask loading activities, inspection and characterization of SNF destined for dry storage, and related training were not avoided costs justifying offset of utility's damages award for Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of SNF, since costs were not incurred to comply with contract, but rather, were incurred as mitigative steps necessitated by safety and regulatory concerns that entirely resulted from DOE's breach, as there were no costs to be avoided without DOE's performance that could ultimately impose far different obligations on utility than mitigation efforts already taken. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

3 Cases that cite this headnote

**[20] Public Contracts**

Breach of contract in general

**United States**

Breach of contract in general

Nuclear utility's costs for alleged special packaging, characterization, and training associated with failed fuel that required separate handling when placing in canisters for dry storage were not avoided costs justifying offset of utility's damages award for Department of Energy's (DOE) partial breach of standard contract, executed pursuant to Nuclear Waste Policy Act (NWPA), by failing to dispose of spent nuclear fuel (SNF) and high level waste (HLW), since no special handling of failed fuel would have been required in non-breach world, and costs were incurred as mitigative steps necessitated by safety and regulatory concerns that entirely resulted from DOE's breach. Nuclear Waste Policy Act of 1982, § 2 et seq., 42 U.S.C.A. § 10101 et seq.; 10 C.F.R. § 961.11.

1 Cases that cite this headnote

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

John Bergen, law clerk.

***OPINION***

BASKIR, Judge.

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

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

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

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

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

- Christine Gelles, a DOE witness from the Office of Environmental Management who provided testimony on concentrations of Greater–Than–Class–C (GTCC) waste in the nuclear industry;
- Dena Berkin, a project manager for SCE who testified pursuant to subpoena concerning the company's corporate accounting systems, particularly in regards to overheads;
- Kimberly Murray, another subpoenaed SCE witness, who had served as a budget manager for SONGS operations and maintenance budget;
- David Zabransky, the Chief Operating Officer for DOE's Office of Civilian Radioactive Waste Management (OCRWM) and the contracting officer for the Standard Contract between DOE and the nuclear utility industry;

***341** • Sander Levin, an engineering consultant who offered opinion testimony regarding certain technical aspects of SCE's mitigation response;

- Dr. Jonathan Neuberger, an economic modeling expert who has testified on behalf of the government in several SNF cases; and
- R. Larry Johnson, an accounting expert who, like Dr. Neuberger and Mr. Zabransky, has provided similar testimony in previous SNF trials.

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

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

***The Standard Contract***

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

In 1987, Congress amended the NWPA and directed that the repository be located inside Yucca Mountain, Nevada. 42 U.S.C. § 10172(a)-(b). After a number of delays, however, DOE announced in 1994 that operations at the proposed repository in Yucca Mountain would commence

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no earlier than 2010. Notice of Inquiry, 59 Fed.Reg. 27, 007–02 (May 25, 1994); *see also,* 60 Fed.Reg. 21, 793; 21, 794 (May 3, 1995). In any event, January 31, 1998, the date DOE was to commence performance, came and went with the defendant unable to accept SNF or HLW because the government had yet to build a permanent geologic repository for these hazardous wastes.

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

On March 3, 2010, DOE filed a motion with the Nuclear Regulatory Commission (NRC) seeking to withdraw its application for a license to operate the Yucca Mountain repository less than two years after the application was filed. *See* DOE's Motion to Withdraw, *In the Matter of DOE (High–Level Waste Repository),* Docket No. 63–001 (NRC Mar. 3, 2010). The request was made "to provide finality in ending the Yucca Mountain project for a permanent geologic repository," according to the motion. *See id.* at 3 (DOE requested that its application be dismissed with prejudice "because it does not intend ever to re-file an application to construct a permanent geologic repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain.") At the same time at least two states, South Carolina and Washington, have ***342** sued to preserve the Yucca Mountain project. Nonetheless, as a practical matter the Yucca Mountain proposal is dead, there are currently no alternate plans for a repository, and the government cannot perform under the Standard Contract.

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

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

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

***Oldest Fuel First***

Not all utilities were to have their SNF picked up on the same date. One of the guiding principles of the Civilian Radioactive Waste Management Program, as set forth in the Standard Contract, is what the parties have dubbed the oldest fuel first (OFF) rule. Under this policy, utilities will receive annual allocations for SNF removal based on

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how long their radioactive wastes have cooled (SNF must cool in a spent fuel pool for at least 5 years before being removed for temporary or permanent storage). The terms of the Standard Contract provide for DOE to issue an acceptance priority ranking (APR) annually, beginning in April 1991, in order to project where a specific allocation of SNF falls in the acceptance queue for the entire nuclear utility industry. Standard Contract, art. IV(B)(5)(a).

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

***Acceptance Rate***

The Standard Contract was silent on the acceptance rate for SNF. Instead, the agreement contemplated that DOE would issue, ***343** not later than July 1, 1987, an annual capacity report (ACR), which is essentially a 10–year planning document to determine how much SNF could be accepted from a source in a given year. *Id.* at art. IV(B)(5)(b). The ACR factors in the department's annual receiving capacity and the acceptance ranking for particular SNF generators, based on the OFF principal. *Id.* Thus, the ACR, working in conjunction with the APR, determines the DOE's acceptance capacity schedule (ACS).

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

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

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

| *Year* | *Receipt Rate (MTU)* |
|---|---|
| 1998 | 1,200 |
| 1999 | 1,200 |
| 2000 | 1,200 |
| 2001 | 1,200 |
| 2002 | 1,200 |
| 2003 | 2,000 |

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| | |
|---|---|
| 200 | 2, 0 |
| 200 | 2, 0 |
| 200 | 2, 0 |
| 200 | 2, 0 |

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

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

***SCE's Operations***

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

Plaintiff's nuclear energy capabilities come from radioactive uranium pellets aligned within long fuel rods, bundled into an array of "assemblies." *Id.* at ¶ 8. The assemblies provide energy for a finite period of time. Once the uranium fuel rods approach the end ***344** of their useful life, the assemblies are removed and replaced with new ones that generate heat and electricity more efficiently. *Id.* at ¶ 9. The "spent nuclear fuel" assemblies are extremely radioactive and, therefore, must be properly treated and stored until accepted by DOE for permanent disposal under the Standard Contract. *Id.*

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

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

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

***SONGS Unit 1 Fuel***

**A. Off–Site Storage SNF**

The plaintiff shipped SONGS Unit 1 spent fuel assemblies from the West Coast to a plant operated by General Electric in Morris, Illinois, to be reprocessed. Between 1974 and 1976, SCE shipped 99 fuel assemblies to GE Morris. *Id.* at ¶ 20. Prior to commencing any reprocessing

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activities, however, the reprocessed spent nuclear fuel program was indefinitely suspended by President Carter. *Id.* at ¶ 21. Although President Reagan later lifted the suspension, commercial spent fuel reprocessing has not been undertaken in the United States. *Id.* As this program was being considered by successive administrations, SCE made arrangements with GE Morris to store the previously delivered assemblies, and shipped additional assemblies, bringing the total number of stored assemblies to 270. *Id.* at ¶ 22; Tr. 246–47.

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

**B. Decommissioning and On–Site Storage of SNF and HLW**

Ultimately, in the mid-to-late 1980's, SCE had to halt its shipments to GE Morris due ***345** to the absence of authorized transportation routes, at which time it began "transhipping" casks of SNF from SONGS Unit 1 to the larger spent fuel pools at Units 2 and 3. Tr. 94; 97 (Reilly). Soon thereafter SCE began the process of decommissioning SONGS Unit 1 rather than embark on expensive upgrades that would be required to maintain operations at the plant. Tr. 97–98.

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

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

***Dry Storage and Other Attempts to Mitigate Damages***

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

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

The plaintiff also made a foray into another, less certain alternative. In 1994, SCE joined a consortium of utilities formed to develop and manage a temporary storage facility for SNF at an undetermined site. The utilities formed a limited liability corporation known as the Private Fuel Storage (PFS) project. Joint Stip. ¶ 46. The trial revealed little in the way of specifics on PFS. We know that the project hinged on a successful partnership with certain Indian tribes for the use of tribal lands in Utah upon which to build and operate a suitable storage facility. *Id.* Utilities paid membership fees in the hopes that one day PFS would emerge as a solution for DOE's tardy performance. *Id.* A select few of the utilities affected by DOE's ***346** breach went one step further and invested as equity partners in the venture. The plaintiff became an equity partner, and initially had a 12.5 percent share in PFS. Tr. 324. According to the undisputed record of plaintiff's expenditures, SCE spent over $2 million in pursuit of the PFS project. Joint Stip. ¶ 47; PX 140. We discuss PFS in more detail below.

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

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

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

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

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

***Overview of Claims and Contested Matters***

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

- Costs of constructing and operating the on-site dry storage facility or ISFSI ($61,981,761 for SONGS Unit 1 and $35,551,467 for SONGS Unit 2);

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- Various types of overhead allocated to the ISFSI project ($19,544,212 for SONGS Unit 1 and $4,113,579 for SONGS Units 2 and 3);

- Off-site storage of SNF at the GE Morris facility ($26,827,548).

- Costs associated with plaintiff's partnership in PFS ($2,088,656);

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

- GTCC-related storage costs and ($1,260,771); and

***347** - Allowance for Funds Used During Construction ("AFUDC"), representing the costs of capital ($605,594).

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

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

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

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

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

- plaintiff's claims for overhead;

- "avoided costs," representing activities that would have been required of SCE had the government performed the contract, such as cask loading, fuel characterization, the provision of failed fuel canisters and training;

- expenditures related to the SCE's investment in PFS; and

- plaintiff's claimed allowance for funds used during construction (AFUDC).

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

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

***Partial Breach of Contract***

**[1]** It is axiomatic in breach of contract cases that the non-breaching party is entitled to damages sufficient to place it in as good a position as it would have been had

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

**[2]** **[3]** Under a partial breach scenario, "the injured party elects to or is required to await the balance of the [breaching party's] performance under the contract," and brings ***348** an interim action to recover only those damages incurred to date. *Ind. Mich.,* 422 F.3d at 1374. Indeed, as the Court of Appeals has noted, the NWPA precludes the parties from treating the government's omissions as a total breach, insofar as the DOE may not be discharged from the responsibility to dispose of SNF and HLW. *Id.* Accordingly, remedies for most SNF claimants are limited to those costs incurred pursuant to the utility's duty to mitigate damages caused by DOE's breach. *Id.* at 1375. Specifically, SCE is entitled to mitigation costs incurred by the utility up to the date of its claims. For purposes of this lawsuit the agreed upon cut-off date for damages is December 31, 2005.

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

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

**[5]** **[6]** Plaintiff can only recover for mitigation efforts if it is shown that these measures were incurred as a direct result of the government's breach, *i.e.,* causation. Assuming causation, the burden then shifts to the defendant. In defending against SCE's damages, the government must affirmatively establish that the mitigation was inappropriate or unreasonable. *Ind. Mich.,* 422 F.3d at 1375. The breaching party may also show that the injured party has avoided certain expenses that it would have incurred in a non-breach scenario. Under these circumstances, mitigation damages are offset by a corresponding amount in order to prevent a windfall to the plaintiff. For example, the defendant argues that SCE's damages are overstated because expenses claimed for cask-loading and other on-site storage activities would ultimately have been borne by the utility under the Standard Contract. The government argues that when DOE eventually performs its contractual obligations and accepts SCE's SNF canisters, the plaintiff will have avoided these responsibilities if reimbursed for them now.

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

***Establishing Causation***

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

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

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

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

***349** Applying the acceptance rates set out in the 1987 ACR to its inventory of SNF, the plaintiff can calculate what amount of SNF, if any, would have been picked up by a date certain. Should the application of that rate show that DOE's pick-up obligations had indeed been triggered by that date, then SCE can successfully demonstrate a direct correlation between the government's breach and the utility's necessity to provide unanticipated storage solutions for its SNF.

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

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

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

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

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

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

***Causation Analysis Applied to SCE's Damages***

Once the appropriate acceptance rate is applied, it is readily apparent that SCE could not sustain operations without making room in the spent fuel pools for additional assemblies on a continuing basis. Consequently, the plaintiff has demonstrated that the need ***350** for temporary storage was caused by the DOE's failure to accept SNF on a timely basis.

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

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

***Acceptance of GTCC***

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

In light of the Circuit Court's contemporaneous holding that the acceptance obligations are spelled out in the 1987 ACR, the defendant argues that GTCC must be factored into the 1987 ACR and assume its place, along with the plaintiff's SNF allocations, in the OFF queue. *See Yankee II,* 536 F.3d at 1274 ("[Th]his court interprets the Standard Contract as requiring the Department to accept SNF and HLW *in accordance with the 1987 annual capacity report process* ") The government ***351** argues that the plaintiff's failure to accommodate GTCC in its analysis is a failure of proof which is fatal to its causation case.

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

21 and 1143–45 (addressing potential methodologies for equating GTCC volumes to current SNF weight values in acceptance queue).

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

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

***Treatment of HLW After Yankee Atomic***

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

In the wake of *Yankee II,* the utility's HLW, including GTCC, must be treated under the same OFF rule as SNF. The utilities certainly expected their GTCC to be hauled away for permanent disposal at some point. But it had not entered the calculus when they made the submissions required to determine ***352** their place in the queue for SNF acceptance.

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

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

*Id.* at 1102. Not only would certain stores of SCE's SNF be kicked back in line due to its own GTCC, the previously

unaccounted for HLW–GTCC of other utilities ahead of SCE in the queue would necessarily result in SCE's acceptance allocations being delayed even further.

***SCE's Revised Model***

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

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

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

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

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

Tr. 147. Given the DOE's past view that GTCC was not covered by the OFF policy, the defendant could offer no evidence to undermine Mr, Reilly's testimony. Mr. Zabransky merely pontificated that assigning a date for GTCC acceptance depended on a number of variables, none of which had been covered by established policy.

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*See* Tr. at 1125 ("[D]epending on what it is ... it could be the date that the piece of material was taken out of service, it could be the end of the cycle that material was taken out of service, it could be when it was packaged and ready for transport, so there's numerous dates that could be assigned.")

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

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

In preparing the EIS, Ms. Gelles is particularly interested in GTCC concentrations among DOE programs. She oversees DOE's low-level waste disposal facilities. Notwithstanding the decision of the Court of Appeals in *Yankee II,* commercially generated GTCC falls within the scope of the department's low-level waste program. Tr. 686–87; *see also,* Tr. 694–96 (explaining the regulatory distinction among four categories of low-level wastes: Class A, Class B, Class C and Greater Than Class C (GTCC)). Consistent with the testimony of Mr. Zabransky, Ms. Gelles confirmed that DOE does not track or record GTCC inventory in the commercial sector. Tr. 734. The most accurate information of ***354** this type would be in the hands of the particular utility generating the waste. *Id.*

In order to arrive at an estimate for the amount of GTCC within the industry, DOE contracted for a study by Sandia National Labs. The product of this study is contained in the July 2007 report entitled "Greater–Than–Class C Low–Level Radioactive Waste and DOE Greater–Than–Class C–Like Waste Inventory Estimates." PX 94; Tr. 705. Ms. Gelles reviewed and approved the report and subsequently released it to the public. Tr. 705–06.

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

There is no telling where among the 100 or so reactors, SCE's GTCC waste falls. However, based upon the data furnished by the government-commissioned study, and the figures represented in DOE's acceptance queue, it is a simple matter to estimate the total volume of GTCC as compared to overall SNF awaiting acceptance under the 1987 ACR. Mr. Myers, testified that the purported industry-wide GTCC—58 cubic meters, or the equivalent of 241.7 assemblies of GTCC—amounts to less than one percent of industry-wide SNF for the first ten years of performance under the Standard Contract. During the course of the first 10 years of contract performance, over 18,600 MTU's of SNF would have been accepted under the 1987 ACR. Tr. 296–97; *see* Table 2.1, 1987

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ACR (JX 4 at SCE001900). Using the data from DOE's most up-to-date APR, which projects total MTU and assemblies by originator and ranking date, Mr. Myers simply extrapolated how many assemblies would have been accepted during that same time frame—he arrived at a total of 26,694 pressured water reactor assemblies. Tr. 297–98; *see* DOE Acceptance Priority Ranking (July 2004) (PX 82) at App. 17. Therefore, almost 242 assemblies worth of GTCC existed in the industry, as compared to the approximately 27,000 SNF assemblies to be accepted by DOE through 2007. Tr. 298. The ratio does not even account for the boiling water reactor assemblies on the APR, which would drive the percentage even lower. Tr. 298–99. By any measure, this amount is statistically insignificant and would not have an appreciable affect on the SNF queue.

**[10]** In arriving at this conclusion, we note that the government does not quarrel with the plaintiff's math. Rather it emphasizes the weaknesses in its own report. During the examination of Ms. Gelles, the defendant highlighted the many limitations inherent in using an environmental planning document to estimate contractual obligations. However, the carefully contrived methodology was a good faith attempt to arrive at the best estimate of GTCC waste within the industry. In light of the fact that the OCRWM has not collected information from utilities about GTCC, *see* Tr. 1122, the 2007 report is the best evidence available. *See* 72 Fed.Reg. at 40139 ("DOE has identified the estimated GTCC [Low level Waste] and GTCC-like waste volumes based on the best available data.").

We have been confronted with many questions and few answers in connection with the GTCC issue. If and when DOE performs, GTCC wastes will presumably be accepted no earlier than the date the reactor was decommissioned. *But see,* Tr. at 1126 (Mr. Zabransky conceded that the OCRWM has made no final determination "for ranking the age of GTCCs"). At the present time, there is no consensus on how GTCC will be stored ***355** awaiting shipment, during transportation, or at its final resting place, whether that be in Yucca Mountain or elsewhere. Furthermore, DOE has given no indication that it will incorporate GTCC wastes into the 1987 ACR or any other planning document. Tr. 1130–32 (Zabransky). Indeed, Mr. Zabransky appeared completely disinterested in the GTCC data compiled by his DOE colleague, Ms. Gelles. As Mr. Zabransky admitted in his own testimony, he had only a passing familiarity with GTCC disposal "because other parts of DOE have had the responsibility for its disposal." Tr. 1053; Tr. 1116–18. He is the first to admit there has been no effort on the part of his office to arrive at a method of measuring GTCC for purposes of determining a corresponding acceptance rate for the MTU. Tr. 1119–20.

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

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

**[11]** **[12]** Moreover, in the context of expectancy damages, any risk of uncertainty is assumed by the party whose wrongful conduct caused the damages. *See Energy Capital,* 302 F.3d at 1327 (citing *Mid–Atlantic Tablewares, Inc. v. Mogi Trading Co.,* 100 F.3d 1353, 1366 (7th

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Cir.1996)); *Locke v. United States,* 283 F.2d 521, 524, 151 Ct.Cl. 262, 267 (1960) ("The defendant who has wrongfully broken a contract should not be permitted to reap advantage from his own wrong by insisting on proof which by reason of his breach is unobtainable.") (citation omitted). We believe the same rule applies to plaintiff's mitigation damages. In considering this issue, we are mindful that "where responsibility for damage is clear, it is not essential that the amount thereof be ascertainable with absolute exactness or mathematical precision: It is enough if the evidence adduced is sufficient to enable a court or jury to make a fair and reasonable approximation." *Nat'l Austl. Bank v. United States,* 452 F.3d 1321, 1327 (Fed.Cir.2006) (citing *Bluebonnet Sav. Bank v. United States,* 266 F.3d 1348, 1355 (Fed.Cir.2001)); *See also Locke,* 283 F.2d at 524 ("Difficulty of ascertainment is not to be confused with right of recovery. Nor does it exonerate the defendant that his misconduct, which has made necessary the inquiry into the question of harm, renders that inquiry difficult.") (citing *Eastman Kodak Co. v. Southern Photo Materials Co.,* 273 U.S. 359, 379, 47 S.Ct. 400, 71 L.Ed. 684 (1927)).

***Overhead Costs***

**A. General**

In addition to the direct costs SNF plaintiffs incurred as a result of the defendant's breach, most utilities have also claimed one or more variants of indirect costs, including several categories of overhead expenses. In ***356** this case, SCE's overhead costs account for a significant percentage of its overall damages; the plaintiff claims over $23 million in overhead associated with operations at the SONGS ISFSIs. *See* PX 125 (breakdown of $146,349,316 total damages claim); DDX 4 at 21–22.

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

The defendant argues that a large percentage of the captured expenses are not incremental to the breach and, therefore, should not be included as damages for the government's partial breach. The government's expert witness, Mr. R. Larry Johnson—whose expertise lies in forensic accounting and financial analysis, not the law—explained the incremental costs concept as it pertains to the overhead claims in this case. Tr. 1156; Tr. 1167–68. He postulated that recovery should be limited to that which "was necessary and related to spent fuel activities and would not have been incurred but for the breach." Tr. 1177; *see also* DDX 4 at 5. The plaintiff contends that each of the costs included among its overhead claim represents true costs to the company, a portion of which are property allocated to the ISFSI just as they would be to any other component of SCE's business.

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

**B. Categories of Overhead**

*(i.) Common Allocation*

"Common allocation" includes expenses that support the entire SONGS site, and which are required by the SONGS operating license and regulatory authority. As Mr. Reilly testified, these costs include items such as the plant's

security, the emergency response system, lease payments, regulatory fees, and the costs of complying with various environmental measures and disposal requirements. *See generally* Tr. at 171–81. The costs are allocated among different projects at SONGS on a constantly adjusting basis.

By definition, the overheads are not tied directly to on-site storage of SNF. Tr. 171–72; 181. Such expenses would be considered "direct costs" of mitigation and are categorized independently in plaintiff's claim. Jorge Morales, the project manager for the construction of the ISFSI, and David Cowell, SCE's budget analyst, testified at length concerning common allocation overheads. The defendant pursued a common theme at cross examination: The witnesses performed no analysis, nor were they aware if one had been done, to determine the extent to which ***357** common allocation costs at SONGS varied as a result of the ISFSI project. *See* Tr. 499–500 (Morales); Tr. 640–41 (Cowell).

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

*(ii.) Corporate Administrative and General*

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

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

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

*(iii.) Internal Market Mechanism*

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

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

**C. Findings and Conclusions Regarding Overhead**

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

Q: Let's look at the next subcategory of costs under the Unit One overhead, which is security. Generally,

what types of costs are included under the security subcategory, as you understand it?

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

And the testimonial record is that the staffing won't have changed. The security guard is someone that waves people in after making sure they're authorized, ***358** and that has nothing to do with something being distinctly related and unique to whether there was [contract] performance. So these costs are costs, much as the other categories I've described, where SCE would have the same costs; they would have the same need to secure the site; they would have the same need for guards and control over access.

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

Tr. 121–13.

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

**[13]** The SONGS overhead fluctuates over time. As the witnesses explained, costs may go up or down based upon the work being performed at each site at any given time. *See* Tr. at 644–45 (Cowell); Tr. at 828–31 (Murray on variable security costs); Tr. at 821 (Berkin on corporate A & G pool changes). Overhead includes fixed costs representing requirements of running the company. Many of these "fixed costs" are typical expenditures of the utility's normal operations. However, the fact remains that the construction, operation and maintenance of a dry storage facility at SONGS is nothing if it is not a necessary and integral part of SCE's overall operations. Consequently, it draws on the company's resources, whether they be payroll services, insurance, or a host of other general expenses which represent the costs of doing business. We agree with the plaintiff's view that the claimed overhead expenses are "necessary to complete the breach-caused projects." PI. Br. at 49; Tr. at 476–82 (Morales); Tr. at 208–11 (Reilly); Tr. at 613–14 (Cowell).

With a few limited exceptions, trial court decisions in previous SNF cases which have addressed the overhead issue have found recovery is proper where there is some connection between the mitigation project and the utilities' overhead. *See, e.g., Tenn. Valley Auth.,* 69 Fed.Cl. at 535, 542 (finding payroll services overhead properly allocated on percentage basis to mitigation activities; no evidence supporting management allocations); *Sys. Fuels, Inc. v. United States,* 78 Fed.Cl. 769, 799 (2007) (denying payroll and capital suspense "loader" costs and allowing material "loader"), *on reconsideration,* 92 Fed.Cl.101 (2010); *Sacramento Mun. Util. Dist. v. United States,* 70 Fed.Cl. 332, 376–77 (2006) (*SMUD I* ) (Damages offset due to plaintiff's failure to demonstrate that costs of human resources, office equipment and the like, were incremental to breach), *rev'd in part on other grounds,* 293 Fed.Appx. 766 (Fed.Cir.2008); *Dominion Resources,* 84 Fed.Cl. at 280–81 (Allowing material overhead, and management and executive services overhead, including costs of "salaries of the corporate accounting group, executives, and corporate security" distributed across projects during the time in question).

The mitigation project must take its place among all the other projects supported by SCE's overhead. *See Carolina Power I,* 82 Fed.Cl. at 48 ("Overhead, by definition, is a cost of doing business, and for some period of time, part of [the utility's] 'business' was mitigating DOE's partial breach."). The record demonstrates common overhead was allocated on a percentage basis to the ISFSI and related activities. *See* Crowel testimony, Tr. at 613 (ISFSI project "receives a *pro rata* distribution of [corporate] costs every month based on a total cost basis."); *see also,* Tr. 211–12 (Reilly); Tr. 822–23 (Berkin). In the *Carolina Power* case, the Court of Appeals affirmed the trial court's award of stores ***359** overhead—warehousing and related labor costs—as well as indirect overhead expenses consisting of salaries for managers and financial

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employees. *Carolina Power II,* 573 F.3d at 1276–77. The Court found these costs were properly diverted to the utility's mitigation projects. As in our case, the plaintiff employed an internal accounting system, using codes to allocate a portion of the overhead to particular projects, based on the work being done to support a project at a particular point in time. *Id.*

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

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

***Private Fuel Storage***

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

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

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

**[15]** Recovery of PFS expenditures has been an issue in several other SNF cases. ***360** The government's objection goes to the foreseeability of these mitigative steps. Thus recovery varies with the facts of each case. *See Bluebonnet Sav.,* 266 F.3d at 1355 ("Foreseeability is a question of fact ...".); *Dairyland Power Co-op v. United States,* 82 Fed.Cl. 379, 386 (2008) (citing *Home Sav. of America v. United States,* 399 F.3d 1341, 1353 (Fed.Cir.2005)). The plaintiff must demonstrate that the magnitude and type of damages were foreseeable at the time that the parties entered into the contract. *Wells Fargo Bank v. United States,* 88 F.3d 1012, 1023–24 (Fed.Cir.1996). These PFS claims have been denied because the utilities' expenditures were found to be speculative investments and thus not foreseeable. *See Ind. Mich.,* 422 F.3d at 1376; *Southern Nuclear,* 77 Fed.Cl. at 446; *Pacific Gas & Elec. Co. v. United States,* 73 Fed.Cl.

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333, 429–30 (2006) ("*PG & E I* "), *aff'd in part, rev'd in part and remanded,* 536 F.3d 1282 (Fed.Cir.2008).

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

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

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

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

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

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

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

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

Finally, in *Wisconsin Electric* the court relied upon specific testimony and contemporaneous documentary evidence demonstrating that PFS, despite higher costs and the delay in achieving storage capability, may ***361** have been viewed as a preferred alternative to on-site dry storage. In securing the requisite approval for construction of its ISFSI, the utility had been criticized by regulatory authorities for not sufficiently exploring PFS. Its pursuit of PFS was motivated by well-founded concerns that the Wisconsin Public Service Commission would disapprove additional casks for the ISFSI. As a result, the utility would not be able to operate through the end of its license. *Wisconsin Elec.,* 90 Fed.Cl. at 779. The testimony revealed that Wisconsin Electric had confronted steep resistance due to concerns by the Commission that the utility's dry storage project "would ultimately become what they called a *de facto* permanent storage." *Id.* In that case, therefore, PFS and approval of the ISFSI were inextricably linked. The plaintiff pursued the parallel mitigation approaches—dry storage which would be available sooner, and PFS which would "be too late for [the plaintiffs] immediate needs and would be more expensive than dry storage"—because the utility was not confident that the regulatory agency would approve the utility's second round of cask loading had the utility not

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

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

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

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

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

Apart from the speculative nature of PFS, we experienced considerable difficulty on this record in determining the amount of plaintiff's PFS damages. Plaintiff obtained an equity share in PFS that ranged from 12.5 percent of the project toward the beginning of SCE's involvement to 5 percent in 2001 when it ended its participation in the consortium. The PFS participation agreement permitted SCE to sell its shares. Tr. 415; DX 98. And, in fact, other utilities did sell their ***362** shares of PFS, which presupposes that there was a market for them. Tr. 418–19; PX 43; *see also,* Tr. 876–77, 911 (Neuberger). Because the plaintiff did not attempt to sell its shares we have no way of determining if the over $2 million of expenditures in PFS might have been offset at a point in time when the investment still had some value. *See Southern Nuclear,* 77 Fed.Cl. at 446 ("[A]ny recovery would require a finding that the retained equity interest, represented by the PFS investment, is of no value, a finding the court declines to make on this record."); Tr. 334:9–13 (Myers); Tr. 182:1–4 (Reilly). In summary, even were we to depart from the majority approach and permit recovery of PFS expenditures, we could not in good conscience award the entire $2,088,656 sought by the plaintiff.

***Allowance for Funds Used During Construction***

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

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The defendant acknowledged that SCE is entitled by regulation to record AFUDC. However, the government opposes the inclusion of AFUDC as damages, arguing that AFUDC is "at bottom, an acknowledgment of the loss of the time value of money expended upon construction projects." Def. Br. at 72. According to the government, SCE is indirectly seeking interest on its mitigation damages, in violation of the rule that the government may not be held liable for prejudgment interest absent an explicit waiver of sovereign immunity. *See* 28 U.S.C. § 2516(a) ("Interest on a claim against the United States shall be allowed in judgment of the United States Court of Federal Claims only under a contract or Act of Congress expressly providing for payment thereof."); *England v. Contel Advanced Sys., Inc.,* 384 F.3d 1372, 1379 (Fed.Cir.2004); *see also Library of Congress v. Shaw,* 478 U.S. 310, 321, 106 S.Ct. 2957, 92 L.Ed.2d 250 (1986) (rejecting attempts to re-characterize "interest" in order to avoid the no-interest rule.) Plaintiff has identified no provision within the Standard Contract nor any statute that would serve as an exception to this principle. Instead, the plaintiff argues that the normal rule against interest on a claim does not apply. According to the plaintiff, AFUDC is not interest on a claim, but interest *as a claim. See* PI. Br. at 58, n.28 (describing AFUDC as interest as "an element of damages.").

This argument has been resolved against the plaintiff in the majority of SNF cases tried to date. *See Wisconsin Elec.,* 90 Fed.Cl. at 794; *Dominion Resources,* 84 Fed.Cl. at 284–85; *Consumers Energy Co. v. United States,* 84 Fed.Cl. 670, 675–77 (2008); *Carolina Power I,* 82 Fed.Cl. at 53; *Sys. Fuels,* 79 Fed.Cl. at 69–70; *Northern States,* 78 Fed.Cl. at 471–72; *Southern Nuclear,* 77 Fed.Cl. at 449. The plaintiff's "interest as a claim" theory cannot prevail where, as here, the utility issued generalized debt instruments in order to fund ISFSI activities. Tr. 628; 632 (Cowell); *see Sys. Fuels,* 79 Fed.Cl. at 70 (Recovery of financing costs denied absent showing that "directly related to required borrowing through specific debt instruments.").

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

> We acknowledge that, with the exception of *Tenn. Valley Auth.,* 69 Fed.Cl. at 540–42, other spent fuel damages cases to date have denied recovery for AFUDC, mostly on the grounds that the company debt for utilities is typically not assigned or attributed to a specific project such as construction of a dry storage facility. *E.g., Dominion Resources,* 84 Fed.Cl. at 285. We ***363** respectfully disagree with those decisions and their rationale. In the real world, it is unquestionably more efficient for most utilities to issue "general," as opposed to "specific," debt, and that is the standard industry practice. We do not believe the applicable legal principles should effectively penalize utilities for such efficient and well-recognized practices. An award of AFUDC is necessary to place the plaintiff in as good a position as if DOE had performed, and is allowed by the controlling authorities.

PI. Br. 59 n.29.

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

On the facts of our case, however, SCE has not convincingly demonstrated that its AFUDC costs can stand as an independent interest claim. As the plaintiff has already explained, there are no specific loans which can be directly traced to the ISFSI project. We believe that this requirement applies to AFUDC just as it applies to other costs of financing. *See Wisconsin Elec.,* 90 Fed.Cl. at 799 (Court acknowledged that AFUDC was a separate line item approval on the utility's ISFSI permit, but found

"[t]here is no tracing to a borrowing, no showing of increase in borrowing because of the dry storage project, and conversely no showing of a decrease in borrowing thereafter."); *but see Tenn. Valley Auth.,* 69 Fed.Cl. at 542 (rejecting defendant's argument that AFUDC requires a "match between capital expenditures and specific debt instruments.") We, therefore, find that the plaintiff's AFUDC damages are barred under 28 U.S.C. § 2516.

***GTCC Storage Costs***

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

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

We have thoroughly analyzed GTCC's impact, if any, on SCE's acceptance queue. In so doing we also addressed the problems inherent in applying GTCC quantities to the OFF scheme in place at the time. There is no clearly defined policy on determining the age of GTCC, as there is for SNF. Tr. 1124–27. There is no convenient and recognized form of measurement for purposes of including GTCC and SNF together for purposes of allocating each in the same queue. *Id.* 1120–21; 1131–32. We are not even sure if the ***364** containment system for GTCC and SNF would share common characteristics. And we suspect that DOE and the nuclear utility industry have no better understanding of these issues than ours. *See id.* at 1064 (In describing "preliminary" plans for SNF and HLW casks, Mr. Zabransky admitted "that's kind of a confusing area right now"). In sum, it is no small challenge to divine the hypothetical non-breach world under these circumstances.

We accept the premise that each party operated under the assumption that GTCC would not be picked up until the decommissioning process was complete. *See* Reilly testimony, Tr. at 147 ("Well, I think it occurs, essentially during decommissioning, so it occurs after fuel, after the unit is shut down and somewhere near—well, after the last fuel is left, so I view it as the last fuel DOE takes, at which point, the contract for that plant is done.") Although SONGS Unit 1 ceased operations in November 1992, decommissioning did not commence until June 1999. Joint Stip. ¶ 25. Yet the plant could not be fully decommissioned for several years after that date, when all of the SONGS Unit 1 assemblies had been removed from SAFSTOR storage in the Unit 1 pool. *Id.* at ¶¶ 29–30. It was not until 2001 that SCE's GTCC was removed from the reactor. It was subsequently packaged into a modified storage canister and then placed in the ISFSI in 2004. *Id.* at ¶¶ 37–38. By that time, there were stores of SNF ahead of the GTCC in the OFF queue.

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

> I think we're trying to be too precise. There isn't a schedule that you can really define here. So I would simply go back to my fundamental expectation, which is we paid in

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> advance for a service, and now it's time for us to—for you to execute that service. And you know it needs to be within reason when our need is. And so, if the GTCC is available and packaged in 2005, in your recent scenario, then I would expect to be trying to arrange its disposal.

*Id.* at 160.

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

***Government–Requested Offsets: SNF–Loadinq and Related Activities***

**A. Offset Theory**

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

In other words, SCE's mitigation activities have *avoided* certain "non-breach world" requirements. Certainly, this is the case where the ISFSI actually results in a cost savings to SCE. For example, the SCE voluntarily deducted $3,757,908 representing certain expenses associated with maintaining ***365** SONGS Unit 1 SNF in SAFSTOR condition in the spent fuel pools. Tr. 10; 59; *see* PX 138 (Summary of Unit 1 SAFSTOR Offset Calculation). Assuming DOE performance under the 1987 ACR rates, plaintiff would have incurred the cost of storing SNF in the spent fuel pools for an additional 10 months, from September 2004 through June 2005. Joint Stip. ¶ 40. Due to the availability of dry storage in the real world—with the construction of the ISFSI—SCE did not. *Id.; see also* Tr. 134–40 (Reilly); Tr. 603 (Cowell).

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

**B. Avoided Costs**

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

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

The Standard Contract contemplated that the utilities would assume responsibility for loading SNF into

dry storage canisters and preparing the canisters for transportation to the permanent repository. Pursuant to the Standard Contract:

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

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

The plaintiff has carried out many of these same responsibilities—including the inspection, preparation and containment of SNF into dry storage casks—but for storage at the ISFSI. *See* Joint Stip. ¶ 42 (stipulated costs of spent fuel characterization and failed fuel canisters). Under the optimistic view, ***366** the plaintiff will someday unload the casks from the ISFSI and present them "as is" to DOE for permanent storage in Yucca Mountain. As the defendant noted at trial, SCE purchased transportable storage canisters in order to store SNF at ISFSI, with the expectation that the fuel could be transported to DOE without being repackaged. Tr. 56 (opening statement); Tr. 198–202 (Reilly cross-examination).

The government argues, therefore, that any mitigation damages awarded should be offset to account for these so-called avoided costs. Relying upon Dr. Neuberger's estimated number of casks loaded, and upon Mr. Sander Levin's testimony concerning the type and costs of the cask that might be used in the event of DOE performance, accountant/ consultant, R. Larry Johnson calculated the hypothetical future costs of loading 40 casks from GE Morris ($1,592,730), 30 casks from SONGS Unit 1 ($2,502,534), and 9 casks from SONGS Units 2 and 3 ($2,415,294). The resulting DOE loading adjustment, according to the government, is $6,510,558. Tr. 1220–24; DDX 4 at 34.

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

**C. Uncertainty as to Future Requirements**

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

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was to fabricate the casks in-house, at approximately $1 million per canister. Tr. 201–02 (Reilly). This approach shielded the company from the problems one may expect in dealing with a private vendor, including supply and quality assurance concerns. *Id.* at 206–07.

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

The government argues that because of work on the dry storage project, SCE personnel will be sufficiently trained when and if the "DOE responsibilities" provision is triggered. Accordingly, defendant argues for a deduction of $3,210,634 in expenses for training ***367** SCE's employees to perform the mitigation project.

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

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

> Well, while the canisters are suitable for shipment, they have to have a shielding cask, so that the shielding cask has to be dealt with and the canisters loaded into them and then whatever has to be done, and there, again, I have no idea what it is because we don't know what it is.
>
> But it would have to be secured for transport and lids put on and whatever work has to be done to load the canister in that cask and make it suitable for shipment would have to be done, whatever it is.

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

When cross-examined about his accounting of avoided costs, another of the government's expert witnesses, forensic accountant R. Larry Johnson, admitted that he did not make any adjustment for potential future loading costs. Tr. 1237–38. He demurred when pressed for an answer on future compliance issues and the arrival one day of DOE-supplied canisters: "It requires omniscience that I don't have..". Tr. 1237. No statement better describes the shortcomings of the defendant's avoided costs theory. This court has rejected proposed offsets similar to those at issue here. The government cannot meet its burden where, as here, "the costs it seeks to offset are cask-specific." *See Energy Northwest,* 91 Fed.Cl. at 553 (Notwithstanding evidence based on characteristics of "proxy" casks, court found that "it is improperly speculative to conclude that [plaintiff] will not incur these costs once the authorized DOE cask is identified and DOE performs under the contract."); *Carolina Power I,* 82 Fed.Cl. at 52 ("Defendant has failed to present any evidence showing with reasonable certainty what [p]laintiffs' loading costs would have been had DOE performed."); *Tenn. Valley Auth.,* 69 Fed.Cl. at 542 (finding that purported benefit to plaintiff "because of delayed loading costs would be entirely speculative."); *PG & E I,* 73 Fed.Cl. at 416 ("[T]he court declines to engage in a guessing game as to whether such deferred costs will have increased or decreased by the time (if ever) defendant performs the parties' Standard Contract.").

It is certainly possible that DOE might ultimately accept SCE's SNF for shipment directly from the ISFSI in its

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present state, without further training and inspection, and without requiring the use of canisters specifically designed for permanent geologic disposal. Mr. Reilly was the first to admit that accepting the existing canisters would be the easiest thing to do. Tr. 200–01. However, this approach might require formally amending the Contract. And we must not ignore the fact that the nuclear waste program operates in a highly regulated environment. It is more likely that the SCE will be required to ***368** reload the SNF into a future type of cask DOE supplies for shipment of the cargo to its ultimate destination. DOE itself acknowledged, when forwarding its SNF Verification Plan, that "due to the uncertainties inherent in the long-term nature of the OCRWM program, it may be necessary to modify the Verification Plan to reflect evolving regulatory or other circumstances." Cover Letter to DOE SNF Verification Plan (May 19, 1997), DX 60 at SCE021520.

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

**[19]** We, therefore, conclude that the plaintiff's production of storage casks, loading activities, fuel characterization, and related training do not justify a reduction of damages. These efforts were not expended in compliance with the contract; they were mitigative steps necessitated by safety and regulatory concerns, due entirely as a result of DOE's breach. To conclude otherwise would require us to speculate in the face of reality. *See Dominion Resources,* 84 Fed.Cl. at 278 ("Plaintiffs' mitigation merely creates temporary on-site storage. It does not substitute performance."). Plaintiff's "ongoing contractual obligation has not yet matured under the terms of the contract itself." *See Yankee II,* 536 F.3d at 1280 (ruling that utility's one-time payment under Standard Contract should not be considered an offset for damages award). As Mr. Reilly testified, the company's "costs have simply been postponed to a later time ... [SCE] will have to do whatever is required when DOE does show up to load casks." Tr. 141. We heard similar testimony by other SCE managers, including Jorge Morales and Paul Myers. *See* Morales testimony at Tr. 484–86 (insisting that fuel characterization and associated training was specific to the ISFSI project and not a proxy for the requirements of DOE loading) and Myers testimony at Tr. 432 (DOE has never committed to take SCE's loaded canisters).

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

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

We conclude that the SCE is entitled to its costs of fabricating the casks. It is also entitled to the labor costs, including training, associated with loading the SNF into the casks and moving them to the ISFSI. Finally, the seemingly routine task of characterizing the fuel prior to loading it for storage is treated in the same manner. *See Dominion Resources,* 84 Fed.Cl. at 279 ("We view fuel characterization costs conceptually similar to costs for loading fuel ... When DOE provides ***369** delivery, plaintiffs will incur these inspection costs again."). Due to the passage of time or the increasing likelihood of a change in circumstances, SCE must operate under the assumption

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that its fuel will have to be re-inspected when DOE finally performs its obligations under the Standard Contract.

**D. *Non-standard Fuel and Failed Fuel***

In addition to the offsets described above, the government has raised certain issues respecting SCE's non-standard fuel and failed fuel. As we discuss below, special rules apply to these categories of SNF. As a result, the timing of DOE acceptance could, hypothetically, be delayed, thus affecting SCE's causation model. At a minimum, the government contends that SCE is responsible for any special handling requirements and, therefore, the plaintiff's damages should be offset accordingly.

*(i.) Non-standard Fuel*

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

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

*(ii.) Failed Fuel*

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

As with non-standard fuel, the Standard Contract gives DOE discretion to adjust the acceptance schedule for failed fuel. The government argues in this case and in others that failed fuel assemblies would not have been accepted in the same manner and in accordance with the same rate as other SNF. Of course, the failed fuel would ultimately be accepted by DOE under the terms of the ***370** contract. Assuming full performance by the government, however, when these canisters are opened and it is discovered that the assemblies are defective, any modifications or special packaging necessitated by the character of the fuel would be the responsibility of SCE, not DOE. Therefore, in addition to the impact on causation, the government argues that plaintiff's damages should be offset by $336,000 to account for the costs of procuring failed fuel canisters. DDX4.

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

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

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

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

Finally, in this case, the failed fuel was "canned" not for transportation to Yucca Mountain, but for placement in dry storage. Moreover, there is no telling whether the failed fuel canisters used will ultimately be acceptable for permanent storage. DOE has yet to provide specifications for the failed fuel canisters, as they are required by the Standard Contract. Standard Contract, art. IV(B)(2)(a); Tr. 239–40 (Myers); Tr. 1137 (Zabransky). For the same reasons cited above with respect other ISIFSI expenses, we do not believe that SCE's containment of failed fuel constitutes an avoided cost.

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

## *CONCLUSION*

As a result of the defendant's partial breach of the Standard Contract, SCE has been forced to come up with alternative storage for its SNF and HLW, build a dry storage facility, and purchase and load special casks onto the facility. It has incurred extensive damages, both in direct expenses and in overheads associated with these mitigation activities. We find in favor of the plaintiff on all but a small percentage of the ***371** damages it has claimed, summarized as follows.

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

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

The damages for ISFSI-related activity are further reduced by SCE's voluntary deduction for costs avoided as a result of the plaintiff's mitigation. The plaintiff conceded that it erroneously included 10 months of SAFSTOR costs for SONGS Unit 1 SNF assemblies. SCE would have

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expended **$3,757,908** to store assemblies in the spent fuel pool prior to acceptance under 1987 ACR. However, the utility avoided the SAFSTOR costs by transporting the assemblies to dry storage.

1

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| | 19, ,212 |
| | 2 ,82 , 8 |
| | 1,2 0, 1 |
| | 3, ,908 |
| | **$103,334,842** |

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| | **$ 39,059,452** |

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

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

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

**IT IS SO ORDERED.**

***372**

**PROTECTED MATERIAL TO BE DISCLOSED ONLY IN ACCORDANCE WITH U.S. COURT OF FEDERAL CLAIMS PROTECTIVE ORDERS IN SPENT NUCLEAR FUEL LITIGATION**

**All Citations**

Nuclear Reg. Rep. P 20,701, 93 Fed.Cl. 337, 72 ERC 1408

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# ENCLOSURE 3

| | |
|---|---|
| Application No.: | A.16-04-001 |
| Exhibit No.: | SCE-05 |
| Witnesses: | S. DiBernardo<br>M. Palanza<br>E. Quach<br>T. Ware<br>T. Watson |

SOUTHERN CALIFORNIA EDISON®

An *EDISON INTERNATIONAL*® Company

(U 338-E)

# *Supplemental Direct Testimony of Southern California Edison Company*

Before the

**Public Utilities Commission of the State of California**

Rosemead, California
June 29, 2016

# SCE-05: Supplemental Direct Testimony of Southern California Edison Company

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# I.

## INTRODUCTION

The purpose of this exhibit, preliminarily marked as Exhibit SCE-05, is to supplement and in certain cases correct SCE's Direct Testimony contained in Exhibits SCE-01 and SCE-02 on the following subjects: (1) Department of Energy Litigation Memorandum Account; (2) Greenhouse Gas Compliance Instrument Procurement; and (3) Least-Cost Dispatch.

## II.

## DEPARTMENT OF ENERGY LITIGATION MEMORANDUM ACCOUNT (DOELMA)

### A. Introduction

In May 2016, SCE received $162 million (includes participants' share) related to the United States Court of Federal Claims decision granting SCE damages for costs incurred from January 1, 2006 through December 31, 2013 for the Department of Energy's (DOE) failure to meet its legal obligation to store used nuclear fuel. Although SCE received these proceeds in 2016, in order to facilitate a more timely return of these funds to customers, SCE is seeking review and refund in this proceeding instead of waiting until the April 1, 2017 ERRA Review filing.[1]

The purpose of this testimony is to: (1) provide the regulatory background associated with the DOELMA; (2) present the entries recorded in the DOELMA from January 2012 through May 2016 for Commission review; (3) request a Commission finding that the entries recorded in the DOELMA are appropriate, correctly stated, and in compliance with Commission decisions; and (4) request Commission approval of SCE's proposed method of the disposition of the net balance in the DOELMA.

#### 1. Background

a) DOE Spent Fuel Litigation - Round 1

On January 29, 2004, SCE filed a complaint (DOE Spent Fuel Litigation – Round 1) against the DOE in the United States Court of Federal Claims, seeking damages resulting from the DOE's failure to begin taking spent nuclear fuel (SNF) and high-level waste (HLW) from San Onofre Nuclear Generating Station (SONGS) Units 1, 2, & 3 for permanent storage in a federal depository, as required under the Standard Contract that SCE entered into

[1] Resolution E-4066 established the DOELMA to record both litigation proceeds and litigation costs and the Resolution requires SCE to make a proposal for disposition of any net litigation proceeds in a formal proceeding such as SCE's next general rate case, or another application. SCE is using this open ERRA Review proceeding as the formal application to propose disposition of the net litigation proceeds related to its Round 2 litigation with the DOE.

with the DOE pursuant to the requirements of the Nuclear Waste Policy Act of 1982. In June 2010, the Court issued a decision granting SCE damages of approximately $142 million (includes participants' share), covering costs incurred from January 1, 1998 through December 31, 2005 for the DOE's failure to meet its contractual obligations. SCE received the damages award payment from the federal government in November 2011, and refunded to the SONGS Units 1, 2, & 3 co-owners their respective share of this award.

SCE included its proposal for the disposition of the DOE Round 1 net proceeds (SCE share of $111.982 million) for years 1998-2005 in its 2011 ERRA Review Application (A.)12-04-001. Since the rate recovery of the independent spent fuel storage installation (ISFSI) project costs over the 1998 – 2005 period differed for SONGS Unit 1 and SONGS Units 2 & 3, SCE's proposal for the disposition of the balance in the DOELMA differed for the damages, net of costs, related to the SONGS Unit 1 ISFSI project and the damages, net of costs, related to the SONGS Units 2 & 3 ISFSI project.

Over the 1998 – 2005 period, the authorized Nuclear Decommissioning Charge (NDC) revenue requirements included the SONGS Unit 1 ISFSI costs. SCE proposed to refund the damages (net of costs) related to SONGS Unit 1 by crediting the Nuclear Decommissioning Adjustment Mechanism (NDAM). In this way, the SONGS Unit 1 net proceeds would be returned to customers in the same manner as the ISFSI costs were recovered from them. Over the eight-year 1998 – 2005 period, the SONGS Units 2 & 3 ISFSI costs were recovered through various generation-related ratemaking mechanisms. SCE therefore proposed to refund to customers the net proceeds related to SONGS Units 2 & 3 (less amounts retained for shareholders for costs that customers did not pay) by crediting the generation subaccount of the Base Revenue Requirement Balancing Account (BRRBA). In this way, these SONGS Units 2 & 3 net proceeds would be returned to customers consistent with how the ISFSI costs were recovered from them.

On January 29, 2013, SCE and ORA filed a *Joint Motion of the Southern California Edison Company and the Office of Ratepayer Advocates' for Approval of Proposed*

*Settlement* in A.12-04-001 to fully resolve the proceeding. The Settlement was adopted by the Commission in Decision (D.)13-12-045, dated December 19, 2013.

b) DOE Spent Fuel Litigation – Round 2

SCE filed a second lawsuit against the DOE in the Court of Federal Claims in December 2011 (DOE Spent Fuel Litigation – Round 2), seeking damages for the period from January 1, 2006 to December 31, 2013 (Round 2 Damages Period) for the DOE's failure to meet its contractual obligations under the Standard Contract. On April 18, 2016, SCE and the Department of Justice, on behalf of DOE, entered into a settlement agreement to resolve the Round 2 litigation. In the settlement agreement, the federal government agreed to pay damages of approximately $162 million (100% share, nominal $) for the Round 2 Damages Period. SCE received the damages award payment from the federal government in May 2016, and refunded to the SONGS Units 1, 2, & 3 co-owners their respective share of this award. All damages recovered by SCE are subject to Commission review as to how these amounts will be distributed among customers, shareholders, or to offset fuel decommissioning or storage or other costs.

Table II-1 below provides the DOE Spent Fuel Litigation - Round 2 proceeds broken out by SONGS unit and cost category.

***Table II-1***
***DOE Spent Fuel Litigation – Round 2 Proceeds***
***by Unit and Cost Category***

| Line No. | Description | ($000) |
|---|---|---|
| 1. | SONGS Unit 1 ISFSI Costs | |
| 2. | Capital | 299 |
| 3. | GE Morris Storage | 38,143 |
| 4. | Subtotal | 38,442 |
| 5. | SONGS Units 2 & 3 ISFSI Costs | |
| 6. | Capital | 119,513 |
| 7. | Fuel Moves (O&M) | 4,400 |
| 8. | Subtotal | 123,913 |
| 9. | Total DOE Litigation Proceeds (Line 4 + Line 8) | 162,355 |
| 10. | SCE Share | 124,033 |

**B. DOELMA Round 2 Litigation Costs**

SCE has incurred litigation costs of $1.804 million (SCE share) for the period January 1, 2012 through May 31, 2016 for the DOE Spent Fuel Litigation – Round 2. This amount includes costs for outside counsel that SCE engaged to litigate the claim, witnesses to testify on SCE's behalf, and other litigation support and related expenses. In its confidential workpapers, SCE is providing comprehensive cost reports summarizing all recorded expenses, journal entries, adjustments, and invoices for the monthly expenditures incurred through the Record Period.

**C. Operation of the DOELMA**

On January 4, 2007, SCE filed Advice Letter 2085-E requesting Commission authority to establish the DOELMA to record litigation costs and damages and other proceeds received from the federal government related to the DOE Spent Fuel Litigation. The Commission approved

this advice letter in Commission Resolution E-4606.[2] In accordance with the resolution, SCE records the difference between the incremental litigation costs incurred, and damages and other proceeds received from the federal government. Litigation costs recorded in the DOELMA are to exclude any in-house counsel or other in-house DOE-related litigation costs. The entries recorded in the DOELMA include the following:

- Outside counsel incremental costs;
- Expert witnesses incremental costs;
- Other outside litigation-related costs; and
- Netted with the proceeds and damages received from the federal government.

Table II-2 below summarizes the operation of the DOELMA from January 1, 2012 through May 31, 2016.[3] The amounts shown include $68,000 incurred by SCE for other outside litigation-related costs. These costs were for supplemental workers needed to respond to the government's audit inquiries. When SCE submitted its Round 2 damages claim against the DOE, the Department of Justice (DOJ) sought to complete an extensive audit, including requests for supporting invoices, accounting, and other related financial information. The government asserted it would seek to delay the litigation if SCE did not provide the requested information within a specified time period. SCE therefore needed to retain supplemental workers to assist so that it could provide timely responses and avoid delays in the recovery of damages.

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[2] Advice Letter 2085-E was approved by the Commission's Energy Division in Resolution E-4066 with an effective date of March 15, 2007.

[3] The DOELMA balance as of December 31, 2011 was zeroed out in accordance with the disposition of the net proceeds resulting from D.13-12-045.

***Table II-2***
***Operation of the DOELMA***
***January 1, 2012 – May 31, 2016***
***($000)***

| Line No. | Description | 2012 | 2013 | 2014 | 2015 | 2016 | Total |
|---|---|---|---|---|---|---|---|
| 1. | Beginning Balance | - | 113 | 197 | 694 | 1,801 | - |
| 2. | Litigation Costs | | | | | | |
| 3. | SONGS 1 Outside Counsel Costs (100%) | 7 | - | - | - | - | 7 |
| 4. | SCE Share | 6 | - | - | - | - | 6 |
| 5. | SONGS 2&3 Outside Counsel Costs (100%) | 143 | 111 | 498 | 1,386 | 257 | 2,394 |
| 6. | SCE Share | 108 | 83 | 374 | 1,041 | 193 | 1,798 |
| 7. | Other Outside Litigaton-related Costs (100%) | - | - | 123 | 65 | (120) | 68 |
| 8. | DOE Proceeds Received | | | | | | |
| 9. | SONGS 1 DOE Proceeds (100%) | - | - | - | - | (38,442) | (38,442) |
| 10. | SCE Share | - | - | - | - | (30,754) | (30,754) |
| 11. | SONGS 2&3 DOE Proceeds (100%) | - | - | - | - | (123,913) | (123,913) |
| 12. | SCE Share | - | - | - | - | (93,279) | (93,279) |
| 13. | Total Costs & Proceeds (Lines 4 + 6 + 7 + 10 + 12) | 113 | 83 | 497 | 1,106 | (123,960) | (122,160) |
| 14. | Interest | 0 | 0 | 0 | 1 | (21) | (20) |
| 15. | Ending Balance (Line 1 + Line 13 + Line 14) | 113 | 197 | 694 | 1,801 | (122,180) | (122,180) |

## D. Proposed Disposition of the DOELMA Balance

The payment received for damages from the federal government in May 2016 is related to expenses incurred by SCE during the eight-year period, 2006 – 2013, associated with the construction and operation of the SONGS ISFSI, as well as expenses incurred storing SNF off-site. The DOELMA credit balance of $122.180 million (including interest) consists of $30.753 million in damages, net of costs, related to SONGS Unit 1 ISFSI construction and operation, and $91.427 million in damages, net of costs, related to SONGS Units 2 & 3 ISFSI construction and operation.

The rate recovery of the ISFSI project costs over the 2006 – 2013 period differed for SONGS Unit 1 and SONGS Units 2 & 3. Therefore, SCE's proposal for disposing the balance in the DOELMA differs for the damages, net of costs, related to the SONGS Unit 1 ISFSI project

and the damages, net of costs, related to the SONGS Units 2 & 3 ISFSI project. Table II-3 below summarizes SCE's proposed disposition of the $122.180 million DOELMA balance as discussed in the following sections.

***Table II-3***
***Proposed Disposition of DOE Round 2 Net Litigation Proceeds***

| Line No. | Description | SONGS Unit 1 | SONGS Units 2&3 | Total |
|---|---|---|---|---|
| 1. | Total Proceeds | (38,442) | (123,913) | (162,355) |
| 2. | Less: Participants Share | (7,688) | (30,634) | (38,323) |
| 3. | SCE Share (Line 1 - Line 2) | (30,754) | (93,279) | (124,033) |
| 4. | Outside Litigation/Other Costs | 7 | 2,463 | 2,470 |
| 5. | Less: Participants Share | 1 | 596 | 597 |
| 6. | SCE Share (Line 4 - Line 5) | 6 | 1,867 | 1,873 |
| 7. | Interest | (5) | (15) | (20) |
| 8. | DOELMA Balance/Net Proceeds (Line 3 + Line 6 + Line 7) | (30,753) | (91,427) | (122,180) |
| 9. | Proceeds Retained by SCE | | | |
| 10. | 2006 GRC Period | - | (16,951) | (16,951) |
| 11. | Allocated Outside Litigation/Other Costs | - | 339 | 339 |
| 12. | SONGS 1 2012 NDCTP Disallowance | (5) | - | (5) |
| 13. | Allocated Outside Litigation/Other Costs | - | - | - |
| 14. | Net Proceeds Retained by SCE | (5) | (16,612) | (16,617) |
| 15. | Proceeds Returned to SCE Customers | | | |
| 16. | Regulatory Asset | - | (73,016) | (73,016) |
| 17. | Allocated Outside Litigation/Other Costs | - | 1,461 | 1,461 |
| 18. | NDAM | (30,748) | - | (30,748) |
| 19. | BRRBA - Generation Sub-account | - | (3,261) | (3,261) |
| 20. | Net Proceeds Returned to SCE Customers | (30,748) | (74,815) | (105,563) |
| 21. | Total Disposition of DOELMA Balance (Line 14 + Line 20) | (30,753) | (91,427) | (122,180) |

## 1. Disposition of the Damages (Net of Costs) Related to SONGS Unit 1

Effective January 1, 1998, SCE established a separate NDC that was applicable to all customers, and also the NDAM to ensure that no more and no less than SCE's authorized

NDC revenue requirements were recovered from customers.[4] Over the 2006 – 2013 period, the authorized NDC revenue requirements included the SONGS Unit 1 ISFSI costs.

The DOE Spent Fuel Litigation - Round 2 damages (net of litigation costs and including interest) related to SONGS Unit 1 are $30.753 million. This amount includes approximately $7,000 (100% share) related to non-Morris SNF storage costs for SONGS Unit 1 for the 2009 – 2012 period that was disallowed in D.14-12-082 (2012 NDCTP). Therefore, it is appropriate for shareholders to retain $5,000 (SCE share) of the DOE Spent Fuel Litigation - Round 2 proceeds.[5] SCE proposes to refund the damages (net of litigation costs and $5,000 to be retained for shareholders[6]) to customers related to SONGS Unit 1 of $30.748 million by crediting the NDAM effective upon a Commission decision in this proceeding. In this way, the SONGS Unit 1 net proceeds will be returned to customers in the same manner as the ISFSI costs were recovered from them.

**2. Disposition of the Damages (Net of Costs) Related to SONGS Units 2&3**

In its 2003 GRC, SCE included a forecast for the 2004 – 2005 nuclear capital additions in accordance with the return to cost-of-service ratemaking for SONGS in that GRC.[7] This forecast included SONGS Units 2 & 3 ISFSI capital expenditures, which SCE forecast to be $25.7 million (SCE share). The Utility Reform Network (TURN) proposed removing 100% of the 2004 – 2005 ISFSI forecast costs based on its position that under the previous ratemaking regime known as "ICIP," rates had already fully covered the costs of the project. The 2003 GRC Decision, D.04-07-022, denied TURN's proposal and determined that it was reasonable to assume that customers had made contributions to the cost of this project. However, since it was

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4 Pursuant to AB 1890 and D.97-08-056.

5 The assignment of litigation costs to the proposed amount to be retained for shareholders is zero due to rounding.

6 In the event SCE receives decommissioning trust reimbursement for these costs (currently before the Commission for approval in A.15-01-014), SCE will return the $5,000 to customers by crediting the generation subaccount of the BRRBA.

7 From 1998 to 2003, SCE recovered SONGS 2 & 3 costs through an Incremental Cost Incentive Pricing (ICIP) ratemaking mechanism, which was a form of performance-based ratemaking under which SCE recovered incremental costs through a cents-per-kWh charge as adopted in D.96-04-059.

impossible to calculate the precise amount of the contribution, the 2003 GRC decision disallowed 50% of the 2004 – 2005 SONGS Units 2 & 3 ISFSI forecast project costs. As a result of this disallowance, SCE wrote off actual 2004 – 2005 SONGS 2 & 3 ISFSI capital expenditures totaling $12.979 million. Given that customers have not and never will pay the $12.979 million (*i.e.*, 50%) of recorded SONGS Units 2 & 3 ISFSI capital costs (based upon the Commission's 50% disallowance), it was appropriate for SCE to retain for shareholders $12.979 million of the awarded damages for the DOE Spent Fuel Litigation -- Round 1, which covered the January 1, 1998 to December 31, 2005 damages period.[8] SCE's proposal was adopted by the Commission in D.13-12-045. The Commission should apply the same approach for Round 2 litigation damages, and allow SCE to retain any costs that were paid only by shareholders in the first instance due to disallowances made in the GRC.

In SCE's 2006 GRC Decision, the Commission stated that since it had previously found that customers had already paid at least for some of the ISFSI costs, and because the customer contribution could not be determined, there should be equal cost responsibility for the remainder of project costs. The 2006 GRC Decision (D.06-05-016) reduced the 2006 beginning-of-year SONGS plant balance by $22.600 million (100% share). As a result of this disallowance, SCE wrote off actual ISFSI capital expenditures totaling $16.951 million (SCE share). Therefore, given that customers have not and never will pay the $16.951 million of recorded SONGS Units 2 & 3 ISFSI capital costs, it is appropriate for SCE shareholders to be reimbursed by allocating $16.951 million of the DOE Spent Fuel Litigation - Round 2 awarded damages to them. This will align the disposition of the DOELMA amount with the Commission-approved ratemaking for this period in the 2006 GRC Decision. SCE also proposes to allocate an equal percentage share of the SONGS Units 2 & 3 litigation/consultant costs to shareholders in the amount of $339,000, resulting in a net allocation of proceeds to shareholders of $16.612 million.

[8] Net of an equal percentage share of the SONGS Units 2 & 3 litigation costs assigned to shareholders.

Pursuant to the SONGS Order Instituting Investigation (OII) (I.)12-10-013 Settlement Agreement adopted by the Commission in D.14-11-040, the annual SONGS Settlement revenue requirement is determined based on a prescribed amortization schedule for the SONGS-related capital investment, including nuclear fuel and Materials and Supplies (M&S).[9] As of January 1, 2016, the remaining capital investment balance in the various regulatory assets is $1.051 billion, with just over six years remaining in the recovery period. The DOE litigation proceeds include refunds of various SONGS 2 & 3 capital expenditures incurred during 2006 through 2013. Therefore, SCE proposes to return to customers its share of the SONGS Units 2 & 3 capital-related DOE Spent Fuel Litigation - Round 2 proceeds in the amount of $73.016 million[10] by reducing the SONGS Units 2 & 3 regulatory asset by this amount, which will benefit customers by reducing the annual SONGS Settlement revenue requirement for the remainder of the recovery period,[11] provided this method is consistent with applicable IRS rules.[12] SCE also proposes to allocate an equal percentage share of the SONGS Units 2 & 3 litigation/consultant costs to the regulatory asset offset in the amount of $1.461 million, resulting in a net allocation of proceeds to reduce the regulatory asset of $71.555 million. By reducing the regulatory asset as proposed, SCE is returning DOE proceeds to customers by reducing their obligations under the SONGS OII settlement agreement.

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9 SCE files an annual Tier 2 advice letter on November 1st of each year to set forth the SONGS Settlement revenue requirement for the subsequent year.

10 SCE's share of the SONGS 2 & 3 capital amount shown on Table I-1 is $73.016 million, after taking into account the $16.951 million reimbursed to shareholders as discussed above.

11 In the advice letter implementing a Commission decision in this proceeding, SCE will update the currently-effective SONGS 2 & 3 settlement revenue requirement for the regulatory asset reduction and credit the generation sub-account of the BRRBA for the difference between the currently-effective SONGS 2 & 3 settlement revenue requirement and the revised SONGS 2 & 3 settlement revenue requirement. BRRBA entries are reviewed by the Commission in SCE's annual ERRA Review proceedings. In addition, in the subsequent Tier 2 advice letters to be filed on November 1st of each year throughout the recovery period, SCE will include the reduction in the regulatory asset in the calculation of the following year's forecast SONGS 2 & 3 settlement revenue requirement.

12 If tax rules or guidance make this proposal infeasible, then SCE proposes to return these funds as described in the following paragraph (*i.e.*, a credit to the generation subaccount of the BRRBA). As mentioned above, BRRBA entries are reviewed by the Commission in SCE's annual ERRA Review proceedings.

Like the ISFSI capital-related revenue requirement, the ISFSI-related O&M costs over the 2006-2013 period were recovered through SCE's generation rates. SCE therefore proposes to refund to customers the remaining, O&M-related $3.261 million of net proceeds related to SONGS Units 2 & 3 ($91.427 million less the $16.612 million reimbursed to shareholders less the $71.555 million reduction to the regulatory asset) by crediting the generation subaccount of the BRRBA upon a Commission decision in this application. In this way, these SONGS Units 2 & 3 net proceeds are returned to customers consistent with how the ISFSI costs were recovered from them (i.e., the net capital-related proceeds will reduce the SONGS regulatory asset and the net O&M-related proceeds will be refunded through BRRBA).

**E. Conclusion**

SCE requests the Commission to find that the costs and proceeds recorded in the DOELMA are properly recorded, consistent with Advice Letter 2085-E, and that the costs are reasonable and recoverable. Upon a Commission finding that both the costs are recoverable and SCE's proposed disposition of the DOELMA balance is reasonable, SCE will: (1) credit $30.748 million to the NDAM, (2) credit $3.261 million to the generation subaccount of the BRRBA, and (3) reduce the SONGS Units 2 & 3 regulatory asset by $71.555 million ($73.016 million less $1.461 million in litigation/consultant costs), including all interest accrued up to the time of the transfers.

## III.

## GREENHOUSE GAS COMPLIANCE INSTRUMENT PROCUREMENT

### A. Introduction and Bundled Procurement Plan Background

California's Global Warming Solutions Act of 2006 (Assembly Bill 32) identified a market-based program as a potential strategy for the California Air Resource Board (CARB) to reduce Green House Gas (GHG) emissions to 1990 levels by the year 2020. On October 27, 2011 CARB adopted a Cap-and-Trade Final Regulation Order.

Compliance with the emissions cap established in the CARB Cap-and-Trade regulation began with calendar year 2013 GHG emissions. CARB created three compliance periods. The first compliance period began January 1, 2013 and covers 2013 through 2014. Covered entities in the first compliance period include operators of any facility that annually emits at least 25,000 metric tons of carbon dioxide equivalents (mtCO2e). Operators are required to obtain and surrender compliance instruments equivalent to the annual GHG emissions for each such facility. Importers of electricity into California are also responsible for obtaining and surrendering compliance instruments for GHG emissions deemed to be associated with electricity imports for purposes of compliance with Cap-and-Trade.

Compliance instrument surrenders associated with the first compliance period occurred in November 2014 and November 2015. At that time, covered entities were required to transfer compliance instruments associated with the quantity of verified, reported emissions to a CARB compliance account.

The second compliance period of the Cap and Trade program began on January 1, 2015 and covers years 2015 through 2017. The third compliance period, for years 2018 through 2020, will commence on January 1, 2018.

There are two types of compliance instruments: allowances, which are limited tradable authorizations created by CARB to emit up to one mtCO2e; and offset credits, which are tradable compliance instruments issued by CARB that represent verified reductions of one mtCO2e from projects whose emissions or avoided emissions are not from a source covered under the Cap-and-

Trade program. For compliance purposes, an offset credit and an allowance have limited differences. Unlike an allowance, an offset credit is not limited by vintage and can be utilized for any surrender year. However, an entity can only use offset credits to meet up to eight percent of its compliance obligation in any compliance period.

The Commission through D.12-12-033 Adopting Cap-and-Trade GHG Allowance Revenue Allocation Methodology, and D.12-04-046 Decision on System Track I and Rules Track III of the Long-Term Procurement Plan Proceeding and Approving Settlement, approved SCE and the other utilities to engage in electricity-related GHG products. SCE submitted its Greenhouse Gas Procurement Plan (GHGPP) in Advice Letter (AL) 2713-E, which was approved by the Commission on July 11, 2013 and incorporated into SCE's 2010 Bundled Procurement Plan (BPP).[13] SCE revised its 2010 BPP to reflect changes in its GHG limits through AL 2824-E (March 4, 2013), and 2958-E (January 15, 2014). A copy of SCE's GHGPP, including the limits that were in effect for all of the 2015 Record Period, is provided in the confidential workpaper that accompanies this testimony.

SCE's GHGPP sets out the Commission-approved products, procurement methods, risk management strategy, credit and collateral requirements, affiliate transaction rules, total procurement limits, transaction rate limits, and other rules governing SCE's transactions in the California GHG cap-and-trade market. Like all other BPP-compliant transactions, provided they comply with the upfront standards contained in SCE's Commission-approved GHGPP (i.e., as incorporated into SCE's BPP), SCE's GHG instrument purchase and sale transactions are deemed *per se reasonable* and are thereby eligible for cost recovery consistent with AB 57.[14]

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[13] SCE's 2010 BPP governed SCE's bundled procurement during all of the 2015 Record Period. The 2010 BPP was submitted in Advice 2713-E-B on July 23, 2012, and approved by the Commission on October 11, 2012 in Resolution E-4542. The 2010 Plan conformed to the modification approved in D.12-01-033 and D.12-04-046.

[14] *See* D.12-01-033, p. 5, Section 3, paragraph 3 - Issued 1/18/2012 - Decision Approving Modified Bundled Procurement Plans.

As explained in Section B. below, SCE's compliance instrument purchases are reviewed for BPP-compliance in SCE's Quarterly Compliance Reviews.

As explained in Section C. below, GHG compliance instrument purchases record to SCE's GHG inventory account. The cost of these instruments is then averaged with the cost of all other instruments in the inventory account, to yield an overall weighted average cost (i.e., $/mtCO2e) of all the instruments in inventory. As SCE incurs GHG compliance obligations each month due to the mtCO2e emitted by SCE-owned and -contracted resources (e.g., by SCE's Mountainview Generating Station), the cost of these obligations is recorded to SCE's ERRA account by applying the inventory weighted average price (in $/mtCO2e) to the mtCO2e emitted using accrual accounting.

## B. GHG Instrument Procurement Review is Performed as Part of SCE's Quarterly Compliance Reports

For the purchases and sales of GHG compliance instruments during the 2015 Record Period (the only such transactions relevant to this proceeding), SCE has demonstrated compliance with its 2010 BPP requirements in its 2015 BPP Quarterly Compliance Reports (QCR); i.e., Advice Letters 3211-E, 3253-E, 3302-E, and 3353-E. At this time, the 2015 3rd Quarter (AL 3302-E) and the 2015 4th Quarter (AL 3353-E) advice letters are still pending final approval from the Commission. For reference, copies of portions of these four QCR filings, which document all of SCE's purchases and sales of GHG compliance instruments during the 2015 Record Period, are provided in the confidential workpapers that accompany this testimony.

## C. GHG Accounting

Pursuant to D.14-10-033, Section 7.6.1 Accounting Procedures, SCE is required to use the accrual method for GHG cost accounting. Prior to October 2014, SCE accounted for GHG costs and revenue on a cash basis. In accordance with this decision, SCE made a true-up adjustment for prior years in October 2014 and continues to use the accrual accounting on a going-forward basis.

When allowances/offsets are purchased at auction or through third parties, SCE records them as GHG allowance inventory at the purchase price. These transactions do not directly record to the ERRA balancing account.

GHG emissions expenses are recognized and recorded in the ERRA balancing account as CO2 is emitted through operations (e.g., generation, imports, and dispatched tolling facilities). In the case of financial settlement, the offset to the emissions expense is a liability or cash paid to the counterparties. In the case of physical settlement, emissions expense is recorded with a corresponding reduction to GHG allowance inventory via a contra account. Copies of SCE's GHG Instrument Inventory Account tracking documents are provided in the confidential workpaper that accompany this testimony. These workpapers document the monthly entries made to reflect SCE's emission obligations incurred each month, as well as the entries showing the addition (to the inventory account) of each instrument purchase executed during the Record Period.

In this proceeding, SCE is not seeking direct recovery of the full cost of GHG compliance transactions that were undertaken during 2015 (pursuant to D.14-10-033). Rather, herein SCE is providing information to facilitate the review of SCE's GHG-related costs that were incurred during the Record Period and appropriately recorded to SCE's ERRA account.

**D. Conclusion**

SCE's GHG compliance instrument procurement transactions are reviewed in SCE's Quarterly Compliance Reports. In the attached workpapers, SCE has provided the additional GHG procurement information agreed upon in the SCE-ORA pending settlement agreement for SCE's 2014 Record Period ERRA Review Phase proceeding (A.15-04-002), to facilitate the review of SCE's GHG-related costs that were incurred during the Record Period and that appropriately recorded to SCE's ERRA account.[15] Herein SCE demonstrates that these ERRA

[15] SCE A.15-04-002, SCE-ORA Proposed Settlement, Article 2.8: "In future ERRA Review proceedings, beginning with SCE's first ERRA Review application filed after the Commission issues a final decision approving this settlement, SCE agrees to provide testimony and workpapers in on its (*Continued*)

account entries are appropriate and correct, available for audit as part of the ERRA Review Phase proceeding process, and are recoverable.

Continued from the previous page

Greenhouse Gas (GHG) compliance instrument purchases and sales conducted (and recorded costs incurred) during the relevant Record Period. If the Commission's final decision approving this settlement comes after April 1, 2016, but before August 1, 2016, SCE agrees to provide supplemental testimony on its GHG compliance instrument purchases and sales conducted (and recorded costs incurred) during the 2015 Record Period in SCE's 2015 Record Year ERRA Review filing."

## IV.

## LEAST COST DISPATCH

### A. Introduction

Decision (D.)15-05-007 included specific guidance on how SCE must demonstrate compliance with the Commission's Least-Cost Dispatch (LCD) requirements. This guidance initially became effective for the 2014 Record Period through an Interim Ruling,[16] and was subsequently adopted by the Commission in D.15-05-007. One component of the demonstration is exception rates and associated cost impacts for SCE-initiated CAISO Master File (Resource Data Template, or RDT) changes regarding thermal resource startup (SU) and minimum load (ML) costs.

### B. Master File (RDT) Change Exceptions

As SCE stated in Exhibit SCE-01, Chapter II, while reviewing its RDT change history for the 2015 Record Period, SCE discovered it had misapplied the CAISO cost cap calculation formula when submitting Registered SU/ML cost values for several of its resources.[17] Following this discovery, SCE subsequently investigated previous years and determined that the issue also occurred during the 2012-2014 Record Periods.

The CAISO Tariff allowed market participants to choose between two methodologies ("Proxy" or "Registered") to declare SU/ML costs. Proxy costs are automatically calculated each day using an indexed natural gas price; Registered costs are fixed values set by the market participant.[18] Registered SU/ML costs are capped at 150% of the respective calculated Proxy costs. In May 2012, SCE began inadvertently utilizing an incorrect (slightly lower) natural gas transportation cost adder when calculating the cost cap for several of its resources, thus under-estimating the cap and in some cases artificially reducing the Registered SU/ML costs. The

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16 Interim Ruling Providing Guidance for 2014 ERRA Compliance Proceedings, dated December 2, 2014.

17 *See* Table II-4 in A.16-04-001, Exhibit SCE-01C, p. 22.

18 *See* Exhibit SCE-01C, p. 21.

incremental cost impact for the 2014 Record Period is -$1,044 and the cost impact for the 2012-2013 Record Periods is $7,564. SCE's confidential workpaper includes detailed information on the evaluation methodology. Table IV-4 below summarizes the incremental exceptions and estimated cost impacts from the subject issue for the 2014 Record Period, Table IV-5 below summarizes the updated portfolio-wide exceptions and estimated cost impacts for the 2014 Record Period,[19] and Table IV-6 below summarizes the estimated cost impacts for the 2012-2013 Record Periods.[20]

***Table IV-4***
***Incremental 2014 Registered Cost Change Exceptions***

| Category | Proxy Elections | Registered Elections | Incorrect Submissions | Error Rate | Est. Cost | Est. Gain | Net Cost Impact |
|---|---|---|---|---|---|---|---|
| Startup | 0 | 0 | 132 | N/A | $ 20,961 | $ (22,019) | $ (1,058) |
| Min. Load | 0 | 0 | 95 | N/A | $ 23,260 | $ (23,245) | $ 14 |
| | | | | | | | |
| **Totals** | **0** | **0** | **227** | **N/A** | **$ 44,220** | **$ (45,264)** | **$ (1,044)** |

***Table IV-5***
***Updated Summary of 2014 Proxy and Registered Cost Change Exceptions***

| Category | Proxy Elections | Registered Elections | Incorrect Submissions | Error Rate | Est. Cost | Est. Gain | Net Cost Impact |
|---|---|---|---|---|---|---|---|
| Startup | 116 | 528 | 149 | 23.14% | $ 304,746 | $ (22,019) | $ 282,727 |
| Min. Load | 504 | 135 | 105 | 16.43% | $ 514,917 | $ (520,339) | $ (5,423) |
| | | | | | | | |
| **Totals** | **620** | **663** | **254** | **19.80%** | **$ 819,662** | **$ (542,358)** | **$ 277,304** |

[19] The updated summary data represents all of SCE's dispatchable thermal resources and supplants Table II-3 in A.15-04-002, Errata to Direct Testimony Exhibit SCE-05C, p. 4. The table provided in SCE's direct testimony inadvertently reflected incorrect cost impacts.

[20] The metrics defined in D.15-05-007 were not in effect for Record Periods 2012-2013, thus SCE did not track overall exception rates or cost impacts. This data represents only the cost impacts of the subject issue.

*Table IV-6*
*Summary of 2012-2013 Proxy and Registered Cost Change Exceptions*

| Category | Proxy Elections | Registered Elections | Incorrect Submissions | Error Rate | Est. Cost | Est. Gain | Net Cost Impact |
|---|---|---|---|---|---|---|---|
| Startup | NA | NA | NA | NA | $ 24,666 | $ - | $ 24,666 |
| Min. Load | NA | NA | NA | NA | $ 5,017 | $ (22,118) | $ (17,102) |
| | | | | | | | |
| **Totals** | **NA** | **NA** | **NA** | **NA** | **$ 29,683** | **$ (22,118)** | **$ 7,564** |

## C. Conclusion

As a result of this investigation, SCE verified the subject calculations are correct for all applicable resources and will monitor them going forward, to ensure the problem does not recur.

# ENCLOSURE 4

Nuclear Reg. Rep. P 20,764
United States Court of Federal Claims.

YANKEE ATOMIC ELECTRIC COMPANY, Plaintiff,
v.
The UNITED STATES, Defendant,
Maine Yankee Atomic Power Company, Plaintiff,
v.
The United States, Defendant,
Connecticut Yankee Atomic
Power Company, Plaintiff,
v.
The United States, Defendant.

Case Nos. 13–584 C, 13–585 C, 13–586 C
|
(Filed UNDER SEAL March 25, 2016)
|
REISSUED April 7, 2016

**Synopsis**

**Background:** Nuclear utilities brought suit against the United States for breach of standard contract for the disposal of spent nuclear fuel (SNF). Government's liability for breach of contract was established, 225 F.3d 1336. Bench trial was held to determine damages.

**Holdings:** The Court of Federal Claims, Merow, Senior Judge, held that:

[1] utilities proved damages to reasonable certainty that were incurred in shutting down plants in course of down-sizing to steady-state existence;

[2] rather extreme expense associated with spent nuclear fuel dry storage construction and maintenance was reasonably foreseeable;

[3] utilities did not carry their burden of proving that they were entitled to recover costs associated with administration of their health and welfare benefits plans that were incurred beyond dates on which each plan would have been terminated in non-breach world;

[4] decision of utility to allocate 90% of proceeds from Federal Energy Regulatory Commission (FERC) settlement agreement over failure of contractor to build dry storage facilities and perform decommissioning activities as offset to its claim for damages was proper;

[5] expert testimony was not required to admit invoices generated in dispositioning challenged properties for nuclear utilities to recover property transfer costs; and

[6] legal and tax expenses were not costs of litigation.

Ordered accordingly.

West Headnotes (15)

**[1] Public Contracts**
Delay

**United States**
Delay

Traditional contract principles govern breach of contract claims against the government over spent nuclear fuel disputes; at the most basic level, the appropriate remedy for the government's breach is damages sufficient to place the injured party in as good a position as it would have been had the breaching party fully performed.

Cases that cite this headnote

**[2] Damages**
Under circumstances within contemplation of parties

**Damages**
Breach of contract in general

Damages for a breach of contract are recoverable where: (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.

Cases that cite this headnote

**[3] Damages**

Under circumstances within contemplation of parties

To establish that damages from a breach of a contract were reasonably foreseeable, a plaintiff must show that the type of damages are foreseeable as well as the fact of damage.

Cases that cite this headnote

[4] **Public Contracts**
Presumptions and burden of proof
**United States**
Presumptions and burden of proof

Plaintiffs alleging that the government breached a contract have the burden to demonstrate that the government's breach was a substantial causal factor in the damages they seek to recover by submitting a comparison between the breach and non-breach worlds; the plaintiff bears the burden of proving the extent to which his incurred costs differ from the costs he would have incurred in the non-breach world.

Cases that cite this headnote

[5] **Damages**
Certainty as to amount or extent of damage
**Damages**
Weight and Sufficiency

Although damages must be shown with reasonable certainty, they need not be ascertainable with absolute exactness or mathematical precision, but recovery for speculative damages is precluded; enough evidence to allow the court to make a fair and reasonable approximation is required.

Cases that cite this headnote

[6] **Public Contracts**
Delay
**United States**
Delay

Nuclear utilities that brought suit against United States for breach of standard contract for disposal of spent nuclear fuel (SNF) proved damages to reasonable certainty that were incurred in shutting down plants in course of down-sizing to steady-state existence, where utilities provided not only detailed documentation of their non-breach world models that they would have been out of business either prior to or during instant claims period, but also a detailed explanation of how they arrived at figures included in those models.

Cases that cite this headnote

[7] **Public Contracts**
Delay
**United States**
Delay

In order to prove breach of contract damages in a spent nuclear fuel dispute, a plaintiff must submit a hypothetical model establishing what its costs would have been in the absence of a breach, and bears the burden of proving the extent to which his incurred costs differ from the costs he would have incurred in the non-breach world.

Cases that cite this headnote

[8] **Damages**
Under circumstances within contemplation of parties

In order to recover on a breach of contract claim, plaintiffs must demonstrate that both the type and amount of damages sought were reasonably foreseeable at the time of contracting.

Cases that cite this headnote

[9] **Public Contracts**
Delay
**United States**
Delay

Rather extreme expense associated with spent nuclear fuel dry storage construction and maintenance was reasonably foreseeable at time that government and nuclear utilities

entered into contracts related to removal of spent nuclear fuel (SNF) from those facilities, as were other expenses incurred in shutting down nuclear power plants in course of down-sizing to steady-state existence, as required for utilities to recover those expenses as damages as result of government's breach of that contract.

Cases that cite this headnote

[10] **Public Contracts**
Delay
**United States**
Delay

Nuclear utilities that brought suit against United States for breach of standard contract for disposal of spent nuclear fuel (SNF) did not carry their burden of proving that they were entitled to recover costs associated with administration of their health and welfare benefits plans that were incurred beyond dates on which each plan would have been terminated in non-breach world, where witnesses for utilities did not possess expertise in area of terminating or transferring health and welfare benefits plans in order to testify on option of transferring obligation to third party, and utilities did not provide any analysis with regard to cost of lump sum payment option or of terminating plans without payment to employees.

Cases that cite this headnote

[11] **Public Contracts**
Delay
**United States**
Delay

Decision of nuclear utility to allocate 90% of proceeds from Federal Energy Regulatory Commission (FERC) settlement agreement over failure of contractor to build dry storage facilities and perform decommissioning activities as offset to its claim for damages was proper, in action against United States for breach of standard contract for disposal of spent nuclear fuel (SNF), where settlement agreement expressly allowed utility to allocate 10% of any additional recovery as decommissioning expense.

Cases that cite this headnote

[12] **Public Contracts**
Delay
**United States**
Delay

Expert testimony was not required to admit invoices generated in dispositioning challenged properties for nuclear utilities to recover property transfer costs in their suit against United States for breach of standard contract for disposal of spent nuclear fuel (SNF), where witness who testified was qualified as expert in dispositioning challenged properties, her opinion as company's vice-president was rooted not only in her particularized knowledge of her company's work and billing practices over 20 years, but in her significant personal involvement with specific projects she was asked to review. Fed. R. Evid. 701.

Cases that cite this headnote

[13] **United States**
Evidence and Affidavits

Criticism of approach that lay witness used to arrive at her conclusions went to weight of evidence, not its admissibility. Fed. R. Evid. 701.

Cases that cite this headnote

[14] **Public Contracts**
Delay
**United States**
Delay

Legal and tax expenses were not costs of litigation, and thus were recoverable in suit against United States for breach of standard contract for disposal of spent nuclear fuel (SNF); utilities engaged tax consultants in order to understand tax

implications of receiving large sums of money from prior round of litigation against government regarding its breach, but those services were not performed in furtherance of utilities' positions related to any round of that litigation, those expenses were related to meeting regulatory requirements, and those costs were foreseeable in event of government's breach due to their nature as ordinary and expected in course of business.

Cases that cite this headnote

**[15] United States**
Expenses Recoverable and Amount Thereof

In the absence of specific statutory authority, expenses incurred in litigation, whether legal, accounting, secretarial, or other, are not awardable as such.

Cases that cite this headnote

**Attorneys and Law Firms**

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Lisa L. Donahue, Commercial Litigation Branch, Civil Division, United States Department of Justice, Washington, D.C., with whom appeared Benjamin C. Mizer, Principal Deputy Assistant Attorney General, Robert E. Kirschman, Jr., Director, Allison Kidd–Miller, Assistant Director, for defendant. Kristin B. McGrory and Heidi L. Osterhout, Trial Attorneys. Jane K. Taylor, Office of General Counsel, United States Department of Energy, Washington, D.C., of counsel.

Spent Nuclear Fuel Storage Cost; Breach of Contract Damages; Cost of Corporation Existence; Termination of Benefit Programs Costs; Property Transfer Costs.

***OPINION***

Merow, Senior Judge

Yankee Atomic Electric Company ("Yankee Atomic"), Maine Yankee Atomic Power Company ("Maine Yankee"), and Connecticut Yankee Atomic Power Company ("Connecticut Yankee") (collectively "plaintiffs"), filed complaints on August 16, 2013, alleging the government's breach of its contractual obligations related to the removal of spent nuclear fuel ("SNF") from plaintiffs' facilities. *See* Case No. 1:13–cv–584, Doc. 1; Case No. 1:13–cv–585, Doc. 1; Case No. 1:13–cv–586, Doc. 1. The three cases have been consolidated for trial. [1]

1 Because the cases often involve identical filings, unless otherwise noted, citations to the docket refer to documents filed in Case No. 1:13–cv–584.

This is the third round of litigation as a result of the government's continuing breach of the same agreements. In the first set of cases, the government's liability was established. *See Yankee Atomic Elec. Co. v. United States,* 73 Fed.Cl. 249 (2006). The parties, however, continue to disagree as to the damages each plaintiff is entitled to recover. Plaintiffs now seek damages in an amount of approximately $77.9 million, for costs incurred as a result of the government's breach between January 1, 2009 and December 31, 2012. *See* Doc. 39 at 6.

To resolve the dispute, trial was held on June 30 through July 1, 2015. Following the submission of post-trial briefs, supplemental briefing was ordered to clarify part of the legal framework for plaintiffs' claims relating to costs associated with administration of health and welfare benefits programs. *See* Doc. 44. Final oral argument was held on Friday, February 19, 2016.

***FINDINGS OF FACT***

The government entered into nearly identical Standard Contracts with each of the utilities in this case, under which the government, through the Department of Energy ("DOE"), agreed to dispose of the utilities' SNF. [2] At the time of trial, all three utilities had been shut down, and currently each maintains its corporate existence only due to the SNF stored at the sites as a result of the government's breach of its obligations to dispose of it. *See* Tr. at 16:18–17:8 (Norton). As a result of this "steady-state" existence, plaintiffs' claim:

> [*A* ]*ll* costs reasonably incurred by each Yankee to maintain its corporate existence following the completion of decommissioning of its power plant are related to the management of SNF/GTCC, and are recoverable unless those costs would have also been incurred in the non-breach world. After the date when the company would have gone out of business in the non-breach world, there should be no set-off to the costs actually incurred.

Doc. 39 at 6–7 (emphasis in original).

2 In *Yankee Atomic Elec. Co. v. United States,* 73 Fed.Cl. 249 (2006), the court wrote extensively on the contracts between the utilities and the government and on the historical context in which the contracts came about. In the interest of focusing on the new issues before the court, the discussion is not repeated in this opinion.

At the direction of the court, the parties have cooperated in an extensive audit process, through which they evaluated the specific costs included in plaintiffs' damages claim. *See* Docs. 12, 13. Although the government contends that plaintiffs should recover none of the claimed damages for failure ***645** to establish a sufficient non-breach world model, *see* Doc. 42 at 19–20, the government specifically objects only to the following categories of damages: (1) the costs to plaintiffs of administering their health and welfare plans, (2) the distribution of settlement proceeds from the Stone & Webster Engineering Corporation ("SWEC") litigation, (3) costs associated with transfer of the property on which the nuclear plants were situated, and (4) the legal and tax expenses related to the recovery of damages from the first round of this litigation. The following facts are relevant to resolving these issues.

**I. Plaintiffs' Calculation of Damages**

Each utility arrived at its amount of claimed damages by calculating the actual costs incurred as a result of the government's breach, less the costs that the utility would have incurred in the non-breach world. *See* Tr. at 83:16–84:4 (Smith). The starting point for these calculations are the storage facility costs, or "ISFSI Operational Costs" for each utility during the claim period. *See* Doc. 39 at 11; Tr. at 91:21–92:3 (Smith). The operational costs include: full and part-time employees, security costs, contracted labor for temporary or special projects, taxes, insurance, utility costs, materials and supplies, and other miscellaneous expenses. *See* Tr. at 17:9–21:14 (Norton). These costs were not only deemed reasonable by plaintiffs' own witness, *see* Tr. at 24:20–26:18 (Norton), but were also reviewed and allowed by the Federal Energy Regulatory Commission ("FERC"), *see* Tr. at 99:11–19 (Smith). The specific figures are presented in Exhibits P3004A, P3005A, and P3006A, each of which is accompanied by supporting details derived from the utilities' accounting system, invoices, purchase orders, and payroll information. *See* Tr. at 95:7–95:18 (Smith).

For Connecticut Yankee and Yankee Atomic, the damages calculation includes offsets for the utilities' corporate existence into the instant claims period. *See* Ex. P3004A, Ex. P3006A; Tr. at 92:23–93:24 (Smith). Absent the government's breach, plaintiffs contend, Connecticut Yankee and Yankee Atomic would have been out of business by the end of 2010. *See* Tr. at 37:14–16 (Norton). No such offset is included in Maine Yankee's calculation of damages because in the non-breach world, it allegedly would have been out of business at the end of 2008. *See* Tr. at 29:1–2 (Norton); 122:7–124:5 (Smith).

Finally, all three utilities include "agreed-to-reductions" in the damages calculus. Through the audit process, the parties agreed to the modification of certain costs in the government's favor. *See* Tr. at 92:6–20 (Smith).

In accordance with this methodology, the specific as follows:

***646**

| | |
|---|---|
| **Connecticut Yankee** | |
| ISFSI Operational Costs: | $36,585,702 |
| Offset for Minimal Corporate Continuation: | ($2,213,299) |
| Agreed-to Reductions: | ($1,444,809) |
| Total: | $32,927,594 |
| **Maine Yankee** | |
| ISFSI Operational Costs: | $25,278,882 |
| Agreed-to Reductions: | ($239,083) |
| Total: | $25,039,799 |
| **Yankee Atomic** | |
| ISFSI Operational Costs: | $22,841,715 |
| Offset for Minimal Corporate Continuation: | ($1,669,886) |
| Agreed-to Reductions: | ($1,235,177) |
| Total: | $19,936,652 |

*See* Doc. 39 at 13–14; Exs. P3004A, P3004B, P3004C (Connecticut Yankee); P3005A, P3005B (Maine Yankee); P3006A, P3006B, P3006C (Yankee Atomic).

**II. Corporate Existence Dates in the Non–Breach World**

A central assumption of plaintiffs' damages claims is that they are entitled to recover the full amount of costs incurred after the date on which each utility would have gone out of business in the non-breach world. Essentially, plaintiffs argue that at some point during this claim period, the liability not only for fuel storage, but also for corporate existence costs, shifts entirely to the government. *See* Tr. at 38:5–9 (Norton). As noted above, plaintiffs contend that the government is no longer entitled to any offsets for Maine Yankee at the end of 2008, and for Connecticut Yankee and Yankee Atomic at the end of 2010.

To establish that these assumptions are appropriate, plaintiffs rely on the experience and testimony of several executive officers, including Mr. Wayne Norton, who serves as President and Chief Executive Officer of Yankee Atomic and Connecticut Yankee and Chief Nuclear Officer for Maine Yankee, *see* Tr. at 9:13–16 (Norton); Mr. Todd Smith, the Director of Operations for all three utilities, *see* Tr. at 77:24–78:7 (Smith); and Ms. Carla Pizzella who serves as the Vice President, Chief Financial Officer and treasurer for all three utilities, as well as assistant secretary for Connecticut Yankee and assistant clerk for Yankee Atomic, *see* Tr. at 184:2–4 (Pizzella).

In determining the dates on which the utilities would have been out of business in the non-breach world, the utilities first assumed that decommissioning would have occurred on the same date in the non-breach world as it did in the real world. *See* Tr. at 26:19–28:1 (Norton). Maine Yankee completed physical decommissioning in 2004, and limited the scope of its license to accommodate only fuel storage in 2005. *See* Tr. at 28:10–20 (Norton). Both Connecticut Yankee and Yankee Atomic were decommissioned in 2007, and plaintiffs assumed they would have terminated their licenses at approximately the same time. *See* Tr. at 34:10–15, 35:23–36:4 (Norton).

The utilities then "estimated the period of time it would take to terminate our benefits programs, disposition our assets and liabilities, including our property, and then ultimately submit to the respective states—Maine, Massachusetts, and Connecticut—our cessation of existence and termination of our ***647** corporations under the appropriate filings with the state." Tr. at 28:2–8 (Norton). Mr. Norton, Ms. Pizzella, and Mr. Smith, three individuals who were intimately involved with critical aspects of the businesses, collaborated as a team to arrive at these estimates. *See* Tr. at 47:7–52:23, 63:14–64:22 (Norton).

Their estimates and assumptions, although necessarily hypothetical due to the government's breach of the Standard Contracts, were not untethered from real world experience. Many of the activities required to shut down the utilities overlap with tasks actually performed by the companies in the course of downsizing to the current steady-state of operations. Mr. Norton described the process of downsizing the companies in his testimony:

> [I]t's a series of regulatory changes; it's a series of programmatic and process changes; it's a series of physical changes at the facility; it's winding down staffing; it's terminating union agreements; it's unwinding assets and liabilities; and getting to the point where you can, in our case, store spent nuclear fuel at a facility that has a reduced license and a reduced organizational structure to support fuel storage until it's removed.

Tr. at 16:10–17 (Norton). Ms. Pizzella has managed the termination of three pension plans and two 401(k) plans for plaintiffs. *See* Tr. at 194:17–25. Pension plans are not health and welfare benefit plans, but pension plans are more complicated to terminate due to governing federal regulations that do not apply to the plans at issue here. *See* Tr. at 195:1–196:25 (Pizzella). In addition, Maine Yankee and Connecticut Yankee have actually gone through the process of dispositioning property that is unencumbered by the presence of spent nuclear fuel. *See* Tr. at 324:16–23 (Richardson) (describing Connecticut Yankee's property disposition); Tr. at 337:11–342:1 (Richardson) (describing Maine Yankee's property disposition).

Mr. Norton and Mr. Smith estimated that it would take an additional three years, or until the end of 2008, for Maine Yankee to complete these activities and wind up corporate existence. *See* Tr. at 29:1–2 (Norton), Tr. at 122:7–124:5 (Smith). After conducting a similar analysis

for Connecticut Yankee and Yankee Atomic, Mr. Norton and Mr. Smith determined that both utilities would have been out of business in the non-breach world by the end of 2010. *See* Tr. at 34:10–36:14 (Norton); Tr. at 124:13–25, 147:21–148:8, 152:25–153:5 (Smith).

The government takes issue with the authority that Mr. Norton, Ms. Pizzella, and Mr. Smith have to determine the actions and time periods that would have been necessary in order to terminate the corporate existence of the utilities, claiming that their testimony lacked specificity and that the witnesses lacked expertise in winding down corporations. *See* Doc. 42 at 14–18. The court disagrees. In the court's view, Mr. Norton, Ms. Pizzella, and Mr. Smith were all credible witnesses and are each well-positioned to understand and testify to the details of the businesses involved in this case. Their testimony provides a solid foundation for the court's conclusion regarding the dates on which each utility would have been out of business in the non-breach world.

The court finds that, absent the government's breach, Maine Yankee would have been out of business by the end of 2008, while Connecticut Yankee and Yankee Atomic would have been out of business by the end of 2010.

**III. Defendant's Specific Challenges**

Apart from its position that plaintiffs should recover no damages due to their alleged failure to present a plausible non-breach world model, the government takes issue with four specific categories of claimed damages.

**A. Benefits Program Administration Costs**

Plaintiffs provide post-retirement health and welfare benefits plans to eligible employees. *See* Tr. at 185:22–25 (Pizzella). The plans include medical, dental, and life insurance benefits. *See* Tr. at 186:17–187:5 (Pizzella). The plans are funded through utility rates and maintained in a Voluntary Employees' Beneficiary Association Fund for Retiree Welfare, or a VEBA trust account. *See* Tr. at 188:15–190:7 (Pizzella). In the course of ***648** administering these plans, plaintiffs incur costs for legal and actuarial services. *See* Tr. at 190:8–191:15 (Pizzella).

All three plaintiffs claim that their respective benefits plans would have been terminated before or during the instant claims period—Maine Yankee at the end of 2006, *see* Tr. at 197:5–9 (Pizzella), and Connecticut Yankee and Yankee Atomic at the end of 2008 (with minimal costs into 2009), *see* Tr. at 197:10–16, 201:21–202:24, 205:21–206:16 (Pizzella). As a result, the argument goes, all costs associated with administering the plans after those dates are recoverable. *See* Doc. 39 at 24.

Plaintiffs claim the following amounts: Maine Yankee, $456,633; Connecticut Yankee, $375,845; and Yankee Atomic, $295,580; for a total of $1,128,058. *See* Ex. P3012.

Plaintiffs had the option to terminate the benefits plans in one of three ways, and the complete discretion to choose between them. *See* Tr. at 197:24–198:7, 199:15–17 (Pizzella). Plaintiffs could have: (1) terminated the plans without making any payments to beneficiaries, *see* Tr. at 198:5–7 (Pizzella); (2) made a lump-sum payment from the trust, divided equally among beneficiaries, *see* Tr. at 198:9–17 (Pizzella); or (3) sold the obligation to pay benefits to a third party administrator, *see* Tr. at 198:18–19 (Pizzella).

The damages that plaintiffs claim in this case are administrative costs paid out of the utilities' operating budgets, not drawn from the corpus of the VEBA trust. *See* Tr. at 191:9–15 (Pizzella). According to plaintiffs, however, all costs associated with terminating the benefits plans under any of the three available methods would come from the trust assets. Tr. at 207:1–10, 236:15–237:9 (Pizzella). As a result, plaintiffs take the position that the non-breach world model need not include any offset for future administration costs, regardless of the method of termination. *See* Doc. 43 at 19; Tr. at 236:17–237:9, 207:1–10 (Pizzella).

At trial, because they insisted it did not make any accounting difference, plaintiffs refused to choose which method of termination they would have pursued in the non-breach world. *See* Tr. at 199:18–200:11; 207:1–10; 236:15–237:9 (Pizzella). In post-trial briefing, however, plaintiffs stated that they would have been most likely to choose the lump-sum payment to beneficiaries. *See* Doc. 45 at 11. Ms. Pizzella testified that if the plan obligations were transferred to a third party, the costs of future administration would be included in the purchase price, which would be paid out of the trust assets. *See* Tr. at 207:1–10; 236:15–237:9 (Pizzella). But plaintiffs have admittedly engaged in no cost analysis for the lump-sum payment option. *See* Tr. at 242:7–11 (Pizzella).

The government agrees that plaintiffs retain discretion as to the method of termination, and do not seriously challenge the dates on which plaintiffs claim the plans would have been terminated in the non-breach world. *See* Doc. 42 at 24–33. It disagrees, though, that administration costs that are currently paid out of the operating budget could be paid from the corpus of the trust in the event of termination. For instance, the government's expert Mr. Larry Johnson, testified that if plaintiffs sold the plan obligations to a third party, they would have been required to make a lump-sum payment from their operating budgets to cover future administrative costs that were "economically equivalent" to the costs incurred in the breach world. *See* Tr. at 406:4–407:9 (Johnson).

Proceeding from this assumption, the government insists that in order to demonstrate a plausible non-breach world scenario, plaintiffs are required to elect between the three methods of termination and account for offsets of any administration costs. *See* Doc. 42 at 29. Because plaintiffs refused to do so, the government contends, they have failed to prove their damages. *See id.*

**B. SWEC Proceeds**

Because the government failed to perform under the Standard Contract, Maine Yankee contracted with Stone and Webster Engineering Corporation ("SWEC") to build dry storage facilities and perform decommissioning activities. SWEC failed to perform and went bankrupt. Maine Yankee recovered damages from SWEC's insurer and as part of a settlement with SWEC's bankruptcy estate. The recovered funds were allocated ***649** between Maine Yankee's decommissioning effort and as an offset to the government's damages for construction of dry storage facilities. [3]

3 The court's opinion in the second round of this litigation explained Maine Yankee's recovery and its allocation in more detail than is necessary to repeat here. *See Yankee Atomic Elec. Co. v. United States,* 113 Fed.Cl. 323 (2013).

Although the court addressed the allocation issue in the second round of this litigation, it has resurfaced now because Maine Yankee received an additional $1,421,000 from the settlement during the instant claim period. *See* Tr. at 207:23–208:13 (Pizzella). The funds resulted from the resolution of coverage issues with SWEC's insurer. *See* Tr. at 38:25–39:17 (Norton). Of the total amount received, Maine Yankee allocated 90% as an offset to its claim against the government, and attributed the remaining 10%, or $142,100, to its decommissioning costs. *See* Tr. at 208:14–21 (Pizzella).

Maine Yankee decided to use the 90/10 allocation in accordance with an Offer of Settlement, approved by FERC, which provided for the proper division of any additional payments received from the SWEC bankruptcy in excess of $1 million. *See* Tr. at 207:23–210:19 (Pizzella). The agreement stated, in relevant part:

> To the extent that Maine Yankee receives more than $1 million in such additional payments on [the SWEC bankruptcy proceeding], on or after such execution date, the Parties agree that Maine Yankee will be permitted to receive 10% of the amount so received over $1 million as an additional Incentive Budget payment. Maine Yankee may withdraw any such additional Incentive Budget payment from the decommissioning trust as a valid decommissioning expense, and distribute to Maine Yankee's owners.

Ex. P3010 at 10.

The government objects to this allocation, claiming that the entire amount of additional funds should be set off from Maine Yankee's claim. *See* Doc. 42 at 37; Tr. at 395:17–21 (Johnson). This position is based on the government's view that such an offset is mandated by this court's previous opinion on the allocation issue. *See id.*

**C. Property Transfer Costs**

In 2007, Connecticut Yankee and Yankee Atomic hired a consulting firm, Vita Nuova, to assist the utilities in navigating the process of dispositioning their properties. *See* Tr. at 315:2 (Richardson). According to Ms. Elaine Richardson, Vita Nuova's Vice President, the company "specialize[s] in redevelopment, redevelopment planning and consulting services related to ... lands that are complicated by either environmental conditions or other challenges, be it legal or regulatory, that may impact the ability to sell a property." Tr. at 287:23–288:6

(Richardson). Over the government's objection, the court qualified Ms. Richardson as an expert in the "disposal of challenged real estate." Tr. at 306:14.

Ms. Richardson acted as project manager for both utilities. *See* Tr. at 314:46; 320:12–15 (Richardson). The work Vita Nuova performed for the utilities involved: (1) reuse assessments to consider the relevant challenges of each parcel and options for disposition, *see* Tr. at 312:21–319:5, 326:15–331:21 (Richardson); (2) efforts to identify interested purchasers, *see* Tr. at 319:6–320:19, 332:1–333:22 (Richardson); and (3) assisting with negotiations and purchase and sale agreements, *see* Tr. at 322:6–22 (Richardson).

Based on the assessments and subsequent efforts to sell the property, Ms. Richardson expressed the opinion that had the government performed under the Standard Contracts, both Connecticut Yankee and Yankee Atomic could have dispositioned the subject properties by the end of 2009. *See* Tr. at 325:7–23; 335:3–24 (Richardson). Although Vita Nuova did not perform the same services for Maine Yankee, based on a review of the assessments and efforts to sell the property made by a different company, Ms. Richardson concluded that Maine Yankee would have been able to disposition all of its property in the non-breach world by the end of 2006. *See* Tr. at 343:7–344:19 (Richardson).

Vita Nuova charged $124,186 for the work performed with respect to the Connecticut ***650** Yankee property between 2009 and 2012. *See* Tr. at 346:11–14 (Richardson); Ex. P3020; Tr. at 156:13–21 (Smith). The company charged Yankee Atomic $198,237 for services performed in the same time period. *See* Tr. at 349:2–5 (Richardson); Ex. P3020; Tr. at 156:13–21 (Smith).

Plaintiffs asked Ms. Richardson to provide an estimate of the fees that would have been charged in the non-breach world, where the presence of spent nuclear fuel would not have been one of the challenges with the property. *See* Tr. at 346:15–20 (Richardson). In order to determine the portion of work attributable to the presence of spent nuclear fuel, Ms. Richardson personally reviewed the invoices and back up documentation associated with each project. *See* Tr. at 346:12–348:20, 349:2–351:16 (Richardson). After her detailed review, and using her personal knowledge of the projects as project manager, Ms. Richardson concluded that approximately 40% of the work for Connecticut Yankee was related to the presence of spent fuel, *see* Tr. at 348:24–349:1 (Richardson), while 20% of the work for Yankee Atomic was related to the fuel, *see* Tr. at 349:13–15 (Richardson). Ms. Richardson testified that her estimates were different for each company because in arriving at her conclusions she took into account the specific, unique challenges at each property. *See* Tr. at 349:16–351:16 (Richardson).

Applying Ms. Richardson's percentages to the total invoiced amount for each company results in a claim for damages in an amount of $89,321–$49,674 from Connecticut Yankee, and $39,647 from Yankee Atomic. *See* Ex. P3020. [4]

4 Plaintiffs' Ex. P3020 actually reflects an amount of $39,648 for property transfer costs incurred by Yankee Atomic. After reviewing the figures, and independently applying Ms. Richardson's percentages to the total costs incurred, it appears to the court that the correct figure is $39,647, and the discrepancy is likely the result of a rounding error.

The government does not claim that the Vita Nuova costs were not incurred, but rather, that plaintiffs should not recover these fees because Ms. Richardson's method for determining the percentage of the work attributable to the presence of spent nuclear fuel was unreliable. *See* Doc. 42 at 40–45.

### D. Legal and Tax Expenses Related to Phase I Damages

The final category of damages to which the government specifically objects is plaintiffs' claims to recover legal and tax expenses that they incurred as a result of receiving a payment for damages awarded in the first round of this litigation. *See* Doc. 39 at 38–39. During the instant claim period, plaintiffs received large payments as a result of the first judgments in this case. *See* Tr. at 211:9–12 (Pizzella).

Ms. Pizzella testified that upon receipt of "[a]ny large cash stream ... we have to do a rate filing and a financial analysis to show to FERC our funding needs and our ability to return the money to our wholesale customers." Tr. at 211:17–24 (Pizzella). In addition to expenses related to meeting the regulatory requirements, plaintiffs engaged tax consultants in order to understand the tax implications of receiving such large sums of money. *See* Tr. at 211:25–212:14 (Pizzella).

Plaintiffs incurred a total of $30,227 in sorting out the legal and tax implications of receiving funds from the first round judgments, divided between the companies as follows: Maine Yankee, $10,500; Connecticut Yankee, $13,727; and Yankee Atomic $6,000. *See* P3013 (the parties agreed during trial to exclude the category of "travel expenses" reflected on this exhibit, *see* Tr. at 214:13–14). Ms. Pizzella testified that these expenses are reasonable based on her experience with the providers on similar, unrelated matters. *See* Tr. at 214:2–4 (Pizzella).

The government objects to plaintiffs' recovery of these expenses because it argues that the costs are legally unrecoverable costs of litigation. *See* Doc. 42 at 45–46.

## *CONCLUSIONS OF LAW*

**[1]** **[2]** As this court has often noted, traditional contract principles govern spent nuclear fuel disputes. At the most basic level, the appropriate remedy for the government's breach "is damages sufficient to place the injured party in as good a position as it ***651** would have been had the breaching party fully performed." *Indiana Michigan Power Co. v. United States,* 422 F.3d 1369, 1373 (Fed.Cir.2005) (citations omitted). Specifically, "[d]amages for a breach of contract are recoverable where: (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." *Id.* (citing *Energy Capital Corp. v. United States,* 302 F.3d 1314, 1320 (Fed.Cir.2002)).

**[3]** To establish that damages were reasonably foreseeable, "a plaintiff must show that the type of damages are foreseeable as well as the fact of damage." *See Vermont Yankee Nuclear Power Corp. v. Entergy Nuclear Vermont Yankee,* 683 F.3d 1330, 1344 (Fed.Cir.2012). As the Federal Circuit has explained:

> Although this does not require "actual foresight" that the breach will cause a "specific injury or a particular amount in money[,] ... the injury actually suffered [still] must be *one of a kind that the defendant had reason to foresee* and of an amount that is not beyond the bounds of reasonable prediction."

*Id.* (citing Joseph M. Perillo, 11 *Corbin on Contracts* § 56.7 at 108 (rev. ed. 2005) (emphasis added)).

**[4]** It is then plaintiffs' burden to demonstrate that the government's breach was a "substantial causal factor" in the damages they seek to recover. *Indiana Michigan,* 422 F.3d at 1373. *See Yankee Atomic Elec. Co. v. United States,* 536 F.3d 1268, 1273 (Fed.Cir.2008), and *Yankee Atomic Elec. Co. v. United States,* 113 Fed.Cl. 323, 332 (2013) (noting that both the "substantial causal factor" test and the "but-for" test are both acceptable standards for determining causation, and choosing to apply the former). To do this, the plaintiff must submit a "comparison between the breach and non-breach worlds." *Yankee Atomic,* 536 F.3d at 1273. The plaintiff bears the burden of proving "the extent to which his incurred costs differ from the costs he would have incurred in the non-breach world." *Energy Nw. v. United States,* 641 F.3d 1300, 1306 (Fed.Cir.2011).

**[5]** And, although damages must be "shown with reasonable certainty," they need not be "ascertainable with absolute exactness or mathematical precision," but "recovery for speculative damages is precluded." *Indiana Michigan,* 422 F.3d at 1373 (citations omitted). Enough evidence to allow the court to make "a fair and reasonable approximation" is required. *Bluebonnet Sav. Bank v. United States,* 266 F.3d 1348, 1355 (Fed.Cir.2001) (citations omitted).

In this round of litigation, plaintiffs have alleged entitlement to damages in the amount of $77.9 million. *See* Doc. 39 at 6. Those damages fall into five categories: (1) operational costs not specifically contested at trial, (2) the costs to plaintiffs of administering their health and welfare plans, (3) the proper allocation of settlement proceeds from the SWEC litigation, (4) costs associated with transfer of the property on which the nuclear plants were situated, and (5) the legal and tax expenses related to damages recovered in the first round of this litigation.

### I. Operational Costs Not Specifically Contested At Trial

**[6]** The government has put forth no argument or evidence that plaintiffs did not incur the claimed expenses, beyond what may have been resolved as part of the audit process. Rather, it raises objections to the legal sufficiency of plaintiffs' proof with regard to the non-breach world models presented at trial. *See* Doc. 42 at 14–24.

**[7]** As a starting point, plaintiffs may only recover costs caused by the government's breach if those costs would not have been incurred in the non-breach world. *See Indiana Michigan,* 422 F.3d at 1373 ("The remedy for breach of contract is damages sufficient to place the injured party in as good a position as it would have been in had the breaching party fully performed."). In order to prove those damages, a plaintiff must "submit a hypothetical model establishing what its costs would have been in the absence of a breach," and bears the burden of proving "the extent to which his incurred costs differ from the costs he would have ***652** incurred in the nonbreach world." *Energy Nw.,* 641 F.3d at 1305–06.

Plaintiffs have submitted non-breach world models to support their damages claims, which the government argues are insufficient. *See* Exs. P3004B, P3006B.

First, the government attacks the dates on which plaintiffs claim each utility would have been out of business, a critical piece of the non-breach world models, arguing that plaintiffs engaged in "no specific analysis" of the issue and simply made unsupported assumptions of what the dates would have been. Doc. 42 at 14. As explained in the court's findings of fact, the court disagrees. Plaintiffs actually engaged in much of the activity required to shut down the plants in the course of down-sizing to the steady-state existence. Furthermore, plaintiffs' witnesses are well-positioned to fill in the blanks that were created by the government's failure to perform.

The government then argues that even if the court agrees with the plaintiffs' termination dates, plaintiffs cannot recover any actual costs because they "offered no foundation or support for their non-breach scenario (in the form of estimated offsets to their actual costs) at trial." Doc. 42 at 20. It claims that plaintiffs were entirely unable to estimate non-breach world costs without the help of outside counsel. *See id.* at 20–21. Plaintiffs did consult an attorney with regard to some non-breach world costs, and the government characterizes that attorney as the "lynchpin" of the plaintiffs' claims. *Id.* The government argues that because the attorney did not testify, the models have insufficient foundation. *See id.*

The government's position is an unsupported exaggeration of outside counsel's role in the non-breach world analysis. As Mr. Smith testified at trial, the attorney was only consulted *after* the non-breach world model had been prepared. *See* Tr. at 123:5–124:5, 173:21–176:2 (Smith). The government presents this fact as a craven attempt on plaintiffs' part "apparently to infuse the model with some credibility," but fails to explain how its characterization of the attorney as the "lynchpin" of the model squares with the fact that he had no hand in creating it. Doc. 42 at 21.

Although not framed precisely in terms of the applicable legal standard, the heart of the government's argument seems to be that the plaintiffs have failed to prove damages to a reasonable certainty. *See Indiana Michigan,* 422 F.3d at 1373 (noting that damages need not be "ascertainable with absolute exactness or mathematical precision," but "recovery for speculative damages is precluded") (citations omitted). Stated differently, the government implies that plaintiffs have failed to provide enough evidence to allow the court to make "a fair and reasonable approximation" of damages. *Bluebonnet Sav. Bank v. United States,* 266 F.3d 1348, 1355 (Fed.Cir.2001) (citations omitted). The government claims that neither Ms. Pizzella, Ms. Richardson, Mr. Norton, nor Mr. Smith gave reliable testimony. Doc. 42 at 15–17. As a result, the government claims, that "[p]laintiffs' complete failure to elicit qualified evidence at trial makes it impossible for them to support their non-breach financial scenario." *Id.* at 19.

Contrary to the government's contention, plaintiffs provided not only detailed documentation of their non-breach world models, but also a detailed explanation of how they arrived at the figures included in those models. Mr. Smith testified that the non-breach world models used in this case were extensions of the models presented in the second round cases. *See* Tr. at 99:24–100:14 (Smith). The initial models were designed by starting with actual operating budgets for each company in the years after completing decommissioning. *See id.* Mr. Smith, Mr. Norton, and Ms. Pizzella then evaluated each line in the budgets and made a determination as to whether a similar activity would have been required in the non-breach world. *See id.*; Tr. at 62:15–64:22 (Norton), 105:15–106:2 (Smith). The models were later refined through discussions with the government. *See* Tr. at 114:13–19 (Smith), 282:21–284:2 (Pizzella).

The difference in this round of litigation, of course, is that plaintiffs have established that all three utilities

would have been out of business either prior to or during the instant *653 claims period. The proposed offsets for costs that the utilities would have incurred in the non-breach world are, therefore, different. Because Maine Yankee would have been out of business by the end of 2008, it makes no offset to costs incurred in this claims period. *See* Tr. at 28:24–34:2 (Norton), 122:7124:5 (Smith). For both Connecticut Yankee and Yankee Atomic, plaintiffs offset their damages claims for operating expenses through the time each utility would have been out of business, at the end of 2010. *See* Tr. at 34:10–36:14 (Norton), 124:13–25, 147:21–148:8, 152:25–153:5 (Smith). Mr. Smith provided detailed explanations of the costs and assumptions built into the models. *See* Tr. at 124:13–127:23, 130:24–133:10, 147:21–155:22 (Smith).

The court found plaintiffs' witnesses credible and believes that they presented the best information possible in the non-breach world models. The government is admonished to remember that its own failure to perform is the principle reason that the plaintiffs are able to present non-breach world costs only with reasonable certainty, rather than with absolute certainty.

[8] [9] Although neither party presents a foreseeability analysis for the general operational expenses, the court notes that the record supports a finding that the claimed costs were sufficiently foreseeable to justify recovery. In order to recover, plaintiffs must demonstrate that both the type and amount of damages sought were reasonably foreseeable at the time of contracting. *See Vermont Yankee Nuclear Power Corp. v. Entergy Nuclear Vermont Yankee,* 683 F.3d 1330, 1344 (Fed.Cir.2012).

The actual costs at issue here are storage facility operational costs incurred by each utility during the claims period. *See* Doc. 39 at 11; Tr. at 91:21–92:3 (Smith). As the court has previously noted, dry storage construction and maintenance were reasonably foreseeable in the event of the government's breach. *Yankee Atomic,* 73 Fed.Cl. at 267 (concluding that "absent DOE performance the need to spend substantial sums for additional at-reactor storage was reasonably foreseeable at the time of contracting"); *id.* at 288 ("The court finds that substantial SNF ... dry storage costs were reasonably foreseeable to DOE, the breaching party at the time of contracting."); *Yankee Atomic Power Co. v. United States,* 94 Fed.Cl. 678, 710–711 (2010) (holding that "[i]n [the] non-breach world, the Yankees' dry storage costs would have been zero because dry storage would not have been built," and noting that the Federal Circuit affirmed the "reasonableness and foreseeability" of the dry storage costs in *Yankee Atomic,* 536 F.3d 1268). Furthermore, the rather extreme expense of maintaining spent nuclear fuel storage is entirely logical. *See Yankee Atomic,* 113 Fed.Cl. at 346 (noting that "[n]uclear fuel storage is inherently a sensitive and expensive endeavor") (citing *Yankee Atomic,* 73 Fed.Cl. at 253 (stating that the disposal of SNF poses a "severe potential health hazard" with "complex technical problems") (citations omitted); *id.* at 251 (noting that domestic utilities were required to enter into the Standard Contracts at issue here due in part to the highly-regulated nature of the nuclear industry, and that DOE agreed to accept the fuel "in return for payment of substantial fees" by the utilities)).

This case presents a new foreseeability issue—whether it was reasonably foreseeable at the time of contracting that plaintiffs would incur damages for corporate existence in the event that the utilities were forced to remain in business as a result of the government's continuing breach. A finding that such damages were reasonably foreseeable is a logical and only incremental extension of the court's previous holdings, and is fully supported by the evidence. The claims are based on dry storage operational costs, which the court has already found to be reasonably foreseeable. And even the language of the Standard Contracts contemplates that the utilities would, at some point, cease producing spent nuclear fuel for the government to dispose of. *See, e.g.,* Ex. P3001 at 8 ("The services to be provided by DOE under this contract shall begin, after commencement of facility operations, not later than January 31, 1998 and shall continue until such time as all SNF and/or HLW from the civilian nuclear power reactors ... has been disposed of.").

*654 Subject to analysis of the government's specific objections, plaintiffs are entitled to recover damages for operational expenses in all three cases.

**II. Benefits Administration Costs**

[10] Plaintiffs seek to recover all costs associated with administration of their health and welfare benefits plans that were incurred beyond the dates on which each plan would have been terminated in the non-breach world. *See* Doc. 39 at 24. Maine Yankee asserts that it would have terminated its plan by the end of 2006, *see* Tr. at 197:5–

9 (Pizzella), while both Connecticut Yankee and Yankee Atomic assert that their respective plans would have been terminated in 2008, with some residual costs incurred in 2009, *see* Tr. at 197:10–16, 201:21–202:24, 205:21–206:16 (Pizzella).

As the court previously explained, plaintiffs have complete discretion to terminate these plans in one of three ways. Plaintiffs could have: (1) terminated the plans without making any payments to beneficiaries, *see* Tr. at 198:5–7 (Pizzella); (2) made a lump-sum payment from the trust, divided equally among beneficiaries, *see* Tr. at 198:9–17 (Pizzella); or (3) sold the obligation to pay benefits to a third party administrator, *see* Tr. at 198:17–18 (Pizzella).

At trial, plaintiffs refused to take a position as to which method of termination they would have selected in the non-breach world. *See* Tr. at 200:7–11 (Pizzella). Plaintiffs claim that any costs associated with effectuating the terminations would come from the trust assets rather than the utilities' operating budgets, thus not requiring any offset in the non-breach world models that support plaintiffs' damages claims in this case. *See* Doc. 43 at 19; Tr. at 207:1–10, 236:15–237:9 (Pizzella). Ms. Pizzella testified to this fact based on her experience transitioning pension obligations to third parties, and did not cite any basis for her assumption that funding administrative costs would work the same way for health and welfare benefits. *See* Tr. at 236:15–237:9 (Pizzella). At oral argument, plaintiffs conceded that Ms. Pizzella's testimony was the only evidence in the record to support this assumption. *See* Oral Arg. Recording, at 1:14:45PM–1:14:55PM (Feb. 19, 2016).

The government presented expert testimony that contradicted Ms. Pizzella's position. Mr. Larry Johnson testified that if plaintiffs sold the plan obligations to a third party, they would have been required to make a lump-sum payment from their operating budgets to cover future administrative costs that were "economically equivalent" to the costs incurred in the breach world. *See* Tr. at 376:19–25, 429:5–18 (Johnson). On the basis of this testimony, the government argues that in order to demonstrate a plausible non-breach world scenario, plaintiffs are required to elect between the three methods of termination and account for offsets of any administration costs. *See* Doc. 42 at 29. Because plaintiffs refused to do so, the government contends, they have failed to prove their damages. *See id.*

Neither party is entirely correct on this point. Contrary to the government's argument, the court would have no reason to require plaintiffs to select between the methods of termination if, in fact, plaintiffs had proven that any costs associated with any of the three methods would have come from the trust funds as opposed to the utilities' operating budgets. The problem for plaintiffs' case is that they did not present sufficient evidence on this point. Plaintiffs performed no financial analysis on either of the first two options. *See* Tr. at 198:3–9 (Pizzella) (stating that plaintiffs would not have chosen to terminate the plans without payment to employees); Tr. at 242:7–11 (Pizzella) (admitting that no analysis was done with regard to the cost of the lump sum payment option). And with regard to the possibility of transferring the obligation to a third party, the court is left with nothing more than competing testimony from Ms. Pizzella and Mr. Johnson on which to base its decision. Both Ms. Pizzella and Mr. Johnson were credible witnesses, but neither possesses expertise in the area of terminating or transferring health and welfare benefits plans. As such, the evidence is in equipoise, and plaintiffs have failed to carry their burden.

***655** Plaintiffs are not entitled to recover the costs of health and welfare benefits administration.

**III. SWEC Proceeds**

**[11]** During the instant claims period, Maine Yankee received final proceeds from the SWEC bankruptcy proceedings in an amount of $1,421,000. *See* Tr. at 207:23–208:13 (Pizzella). The parties disagree, as they did in the previous round of litigation, regarding how these funds should be allocated between Maine Yankee's decommissioning effort and as an offset to the government's damages for construction of dry storage facilities.

Plaintiffs have allocated 90% of the funds as an offset to its claim against the government, and attributed the remaining 10%, or $142,100, to its decommissioning costs. *See* Tr. at 208:14–21 (Pizzella). As noted above, Maine Yankee decided to use the 90/10 allocation in accordance with an Offer of Settlement, approved by FERC, which provided for the proper division of any additional payments received from the SWEC bankruptcy in excess of $1 million. *See* Tr. at 207:23–210:19 (Pizzella). The agreement stated, in relevant part:

> To the extent that Maine Yankee receives more than $1 million in such additional payments on [the SWEC bankruptcy proceeding], on or after such execution date, the Parties agree that Maine Yankee will be permitted to receive 10% of the amount so received over $1 million as an additional Incentive Budget payment. Maine Yankee may withdraw any such additional Incentive Budget payment from the decommissioning trust as a valid decommissioning expense, and distribute to Maine Yankee's owners.

Ex. P3010 at 10.

The government objects to this allocation, claiming that the entire amount of additional funds should be set off from plaintiff's claim. *See* Doc. 42 at 37; Tr. at 395:17–21 (Johnson). This position is based on the government's view that such an offset is mandated by this court's previous opinion on the allocation issue. *See id.* The government claims that the court "adopted the cap methodology" advocated by Maine Yankee in the second round of this litigation. Doc. 42 at 36.

The government has misread the court's previous opinion. Rather than adopt Maine Yankee's methodology, the court simply held plaintiff to its proposed offset because the government's own logic would have resulted in an even smaller offset than plaintiff was willing to give. *See Yankee Atomic Elec. Co.,* 113 Fed.Cl. at 339 ("Because [the figure resulting from the method of calculation presented by the government] is well-below the $5.4 million that Maine Yankee has already allocated, the court denies the government's claim to an additional credit. The court will, however, hold Maine Yankee to its $5.4 million figure.").

The FERC settlement agreement expressly allows Maine Yankee to allocate 10% of any additional recovery, or $142,100 in this case, as a decommissioning expense. The government has presented no argument or evidence that the agreement is invalid or otherwise does not apply in the current circumstances, beyond its incorrect argument with regard to the court's previous opinion. As such, the court finds that Maine Yankee's decision to allocate 90% of the SWEC proceeds as an offset to its claim for damages is proper.

**IV. Property Transfer Costs**

**[12]** Connecticut Yankee and Yankee Atomic hired Vita Nuova, a consulting firm that specializes in dealing with challenged properties, to assist the utilities in dispositioning their land. The work Vita Nuova performed for the utilities included: (1) reuse assessments to consider the relevant challenges of each parcel and options for disposition, *see* Tr. at 312:21–319:5, 326:15–331:21 (Richardson); (2) efforts to identify interested purchasers, *see* Tr. at 319:6–320:19, 332:1–333:22 (Richardson); and (3) assisting with negotiations and purchase and sale agreements, *see* Tr. at 322:6–22 (Richardson). For these services, Vita Nuova charged Connecticut Yankee $124,186, and charged Yankee Atomic $198,237. *See* Ex. P3020.

Ms. Elaine Richardson, Vita Nuova's Vice President, served as project manager on both ***656** accounts. *See* Tr. at 287:22–288:6, 314:6–320:12–15 (Richardson). At trial, the court qualified her as an expert in dispositioning challenged properties. *See* Tr. at 306:8–16 (Richardson). On the basis of her expertise, she testified with regard to the time it would have taken in the non-breach world to disposition property that is now complicated by the presence of dry storage facilities. *See* Tr. at 324:24–325:23, 335:3–337:10 (Richardson).

Ms. Richardson also testified at trial that the actual cost of Vita Nuova's services was higher than it would have been in the non-breach world due to the presence of spent nuclear fuel on the sites. Specifically, she concluded that approximately 40% of the work for Connecticut Yankee was related to the presence of spent fuel, *see* Tr. at 348:24–349:1 (Richardson), while 20% of the work for Yankee Atomic was related to the fuel, *see* Tr. at 349:13–15 (Richardson). Plaintiffs now seek to recover this difference as part of their breach damages.

In coming to these percentages, Ms. Richardson personally reviewed the invoices and back up documentation associated with each project. *See* Tr. at 346:12–348:20, 349:2–351:16 (Richardson). She testified that the percentages were different for each company because in arriving at her conclusions she took into account the specific, unique challenges at each property. *See* Tr. at 349:16–351:16 (Richardson). Ms. Richardson

did not produce documentation of her review process or any sort of work papers to support her conclusions. Rather, her estimates were based on her personal knowledge of the projects.

At trial, the government objected to her testimony on this point, and the court heard the evidence as an offer of proof. *See* Tr. at 303:4–8. The government does not take issue with costs incurred, but argues that Ms. Richardson's methodology for arriving at these estimates is unreliable, and therefore, that plaintiffs cannot recover. *See* Doc. 42 at 40–45. In addition, according to the government, Ms. Richardson's testimony is inadmissible because "specialized expertise is necessary to determine what Vita Nuova costs were attributable to the presence of spent fuel," and she was not qualified as an expert on this issue. *See id.* at 44.

As an initial matter, the court sees no reason that expert testimony would be required to apportion Vita Nuova's invoices. Under Federal Rule of Evidence 701, lay opinion testimony is sufficient so long as the opinion is:

(a) rationally based on the witness's perception;

(b) helpful to clearly understanding the witness's testimony or to determining a fact in issue; and

(c) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702.

By way of explication, the Advisory Committee noted that most courts do not require expert testimony on financial matters relating to a business's value or expected profits, so long as the offered testimony is based on "particularized knowledge that the witness has by virtue of his or her position in the business." Fed.R.Evid. 701, Advisory Committee Notes, 2000 Amendments (citing *Lightning Lube, Inc. v. Witco Corp.*, 4 F.3d 1153 (3d Cir.1993)) (finding no abuse of discretion in permitting the plaintiff's owner to give lay opinion testimony as to damages, as it was based on his knowledge and participation in the day-to-day affairs of the business).

The government claims that expert testimony is required under these circumstances because Ms. Richardson did more than simply add numbers. *See* Doc. 42 at 44. To support this position, the government cites several cases. First, the government points to *In re MarketXT Holdings Corp.*, No. 1:04–12078(ALG), 2011 WL 1422012 (Bankr.S.D.N.Y. Jan. 7, 2011). In that case, the Bankruptcy Court for the Southern District of New York excluded lay testimony that related to "the state of the securities markets, the state of the day-trading industry, customs and practices within the day-trading industry, and the alleged potential profitability of the MTG, measured by its own characteristics and by comparison with the performance of allegedly similar groups." *See id.*, at *1. The court reasoned that the proposed ***657** testimony should be excluded because it was not an opinion based on actual business performance within the witness's own perception, but was based on a series of complex assumptions relating to financial market performance. *See id.*, at *5, *6.

The government also cites *LifeWise Master Funding v. Telebank*, 374 F.3d 917, 929 (10th Cir.2004) and *Bank of China, New York Branch v. NBM LLC*, 359 F.3d 171 (2d Cir.2004). In *LifeWise*, the appellate court held that the company's Chief Executive Officer was improperly allowed to testify as to lost profits because his testimony was not based simply on his personal knowledge of the company's operations, but instead involved "rolling averages, S-curves, and compound growth rates that appear to be an amalgam of logic, hope, and economic jargon." *LifeWise*, 374 F.3d at 930. And continuing with the common thread that only testimony based on personal knowledge is permitted, the appellate court in *Bank of China*, disallowed a witness's testimony because it was "not based entirely on [the company employee's] perceptions," but also required reference to his "experience and specialized knowledge in international banking." *Bank of China*, 359 F.3d at 181.

The testimony regarding complex projections and specialized knowledge of financial markets and banking involved in the cases highlighted by the government bears no resemblance to Ms. Richardson's testimony here. Her opinion was rooted not only in her particularized knowledge of Vita Nuova's work and billing practices, but in her significant personal involvement with the specific projects she was asked to review. Ms. Richardson considered actual invoices, for work actually performed, on projects managed by her, to draw her conclusions regarding what portion of that work was required as a result of the presence of spent nuclear fuel. Her testimony on this issue is admissible under Rule 701 as lay opinion.

**[13]** The government also attacks the reliability of her methods—whether she is considered a lay or an expert witness. *See* Doc. 42 at 42–43. Had the court concluded that expert testimony was required on this point, plaintiffs would have been required to demonstrate that Ms. Richardson's methods were reliable. *See* Fed.R.Evid. 702 (requiring that "(c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case"). Because her testimony is acceptable as a lay opinion, however, the government's criticism of her approach goes to the weight of the evidence, not its admissibility.

The court found Ms. Richardson to be a diligent and credible witness. She has worked with Vita Nuova for nearly 20 years, *see* Tr. at 287:21 (Richardson), and as the company's Vice President is undoubtedly familiar with their billing practices. She personally managed the projects at issue, and therefore, was well-positioned to evaluate the extent to which the presence of spent fuel affected each billable activity. The government's position that Ms. Richardson's evaluation required expertise evinces an overly-complicated view of a relatively straightforward task. The court admits Ms. Richardson's testimony as sufficient to carry plaintiff's burden.

Applying Ms. Richardson's percentages to the total invoiced amount for each company, Connecticut Yankee is entitled to recover $49,674 for property transfer costs, and Yankee Atomic is entitled to recover $39,647.

**V. Legal and Tax Expenses Related to Phase I Damages Award**

**[14]** During the instant claims period, plaintiffs received a large payment from the government pursuant to the judgments in the first round of this litigation. *See* Tr. at 211:9–12 (Pizzella). As a result of that income, plaintiffs incurred legal and tax expenses in an amount of $30,227 that they now seek to recover. Ms. Pizzella testified that, based on her experience with procuring similar services, these expenses are reasonable. *See* Tr. at 214:2–4 (Pizzella). The government does not contest the fact that the costs were incurred, or that they are reasonable, but argues that they should be categorized as legally unrecoverable costs of litigation. *See* Doc. 42 at 45–46.

**[15]** ***658** "It is well settled that in the absence of specific statutory authority, expenses incurred in litigation, whether legal, accounting, secretarial, or other, are not awardable as such." *Kania v. United States,* 650 F.2d 264, 269 (Ct.Cl.1981) (citations omitted). The costs claimed by plaintiffs, however, were not "incurred in litigation," within the plain meaning of that phrase. Ms. Pizzella testified that upon receipt of "[a]ny large cash stream ... we have to do a rate filing and a financial analysis to show to FERC our funding needs and our ability to return the money to our wholesale customers." Tr. at 211:17–24 (Pizzella). In addition to expenses related to meeting the regulatory requirements, plaintiffs engaged tax consultants in order to understand the tax implications of receiving such large sums of money. *See* Tr. at 211:25–212:14 (Pizzella). Plaintiffs do not seek to recover on invoices from their attorneys in the first round of litigation. And the services at issue were not performed in furtherance of plaintiffs' positions related to any round of this litigation.

Furthermore, these costs were foreseeable in the event of the government's breach. Ms. Pizzella testified: "Any fund stream I receive, I have to analyze it from a tax stand point, from a regulatory standpoint. That's what this is. This is, to me, normal business activities [sic] that we undertake." *See* Tr. at 213:7–214:4 (Pizzella). The nature of these expenses, as ordinary and expected in the course of business, demonstrates that the parties should have foreseen them as a consequence of a breach at the time of contracting.

Plaintiffs' are entitled to recover $30,227, divided between the companies as follows: Maine Yankee, $10,500; Connecticut Yankee, $13,727; and Yankee Atomic $6,000.

***CONCLUSION***

Based on the foregoing analysis, the court awards the plaintiffs the following damages:

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| | |
|---|---|
| **Yankee Atomic** | |
| Damages not specifically contested at trial: | $19,595,425 |
| Property transfer costs: | $39,647 |
| Legal and tax expenses: | $6,000 |
| Total recovery: | $19,641,072 |
| **Maine Yankee** | |
| Damages not specifically contested at trial: | $24,430,566 |
| SWEC proceeds: | $142,100 |
| Legal and tax expenses: | $10,500 |
| Total recovery: | $24,583,166 |
| **Connecticut Yankee** | |
| Damages not specifically contested at trial: | $32,488,348 |
| Property transfer costs: | $49,674 |
| Legal and tax expenses: | $13,727 |
| Total recovery: | $32,551,749 |

All pending motions are **DENIED** as moot.

The court has filed this opinion under seal in the event that information contained herein ***659** remains sensitive. The parties are directed to submit any proposed redactions within **fourteen days of the date of this opinion.**

The clerk is directed to enter final judgment in favor of Yankee Atomic in an amount of $19,641,072, final judgment in favor of Maine Yankee in an amount of $24,583,166, and final judgment in favor of Connecticut Yankee in an amount of $32,551,749.

**SO ORDERED.**

**All Citations**

Nuclear Reg. Rep. P 20,764, 125 Fed.Cl. 641, 82 ERC 1650

End of Document 201

# ENCLOSURE 5

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Nuclear Reg. Rep. P 20,780
United States Court of Federal Claims.

SACRAMENTO MUNICIPAL UTILITY DISTRICT, Plaintiff,
v.
UNITED STATES, Defendant.

No. 15–577C
|
Filed: February 28, 2017

**Synopsis**

**Background:** Nuclear utility sued United States, claiming that Department of Energy (DOE) partially breached standard contract, requiring DOE to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at utility's nuclear power plant, in exchange for fees that utility paid to nuclear waste fund, pursuant to Nuclear Waste Policy Act (NWPA), and seeking to recover mitigation costs incurred during five-year period.

**Holdings:** The Court of Federal Claims, Braden, J., held that:

[1] DOE partially breached contract;

[2] costs of maintaining and operating two buildings were recoverable;

[3] costs of site consolidation, water and septic system upgrades, and planning to replace backup generator were recoverable;

[4] costs of replacing heating, ventilation, and air conditioning unit and installing new carpet were recoverable;

[5] costs for replacing backup generator and partially refurbishing electrical infrastructure were recoverable;

[6] costs for maintaining interim onsite storage building (IOSB) and refurbishing fuel-handling equipment were recoverable;

[7] costs for insurance brokerage fees were recoverable; but

[8] government was entitled to offset for insurance refunds that utility received.

Ordered accordingly.

West Headnotes (32)

**[1] United States**
Claims against United States in general

The Tucker Act is a jurisdictional statute that does not create any substantive right enforceable against the United States for money damages; rather, the Tucker Act merely confers jurisdiction upon the Court of Federal Claims whenever the substantive right exists. 28 U.S.C.A. § 1491(a)(1).

Cases that cite this headnote

**[2] United States**
Claims against United States in general

To pursue a substantive right under the Tucker Act, a plaintiff must identify and plead an independent contractual relationship, constitutional provision, federal statute, and/or executive agency regulation that provides a substantive right to money damages from the United States. 28 U.S.C.A. § 1491(a)(1).

Cases that cite this headnote

**[3] United States**
Contract Claims

In a breach of contract case against the United States, the money-mandating requirement for Tucker Act jurisdiction normally is satisfied by the presumption that money damages are available for breach of contract, with no further inquiry being necessary. 28 U.S.C.A. § 1491(a)(1).

Cases that cite this headnote

**[4] United States**
Contract Claims

Nuclear utility's claim that Department of Energy (DOE) partially breached standard contract by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at utility's nuclear power plant and that utility was entitled to damages for DOE's breach was within jurisdiction of Court of Federal Claims under Tucker Act, since claim was based on independent contractual relationship that provided substantive right to money damages from United States. 28 U.S.C.A. § 1491(a)(1).

Cases that cite this headnote

**[5] United States**
Standing

The question of standing is whether the litigant is entitled to have the Court of Federal Claims decide the merits of the dispute or of particular issues.

Cases that cite this headnote

**[6] United States**
Standing

Standing to pursue a claim in the Court of Federal Claims must be determined as of the commencement of suit.

Cases that cite this headnote

**[7] United States**
As to jurisdiction

The party invoking federal jurisdiction bears the burden of establishing standing to pursue a claim against the United States.

Cases that cite this headnote

**[8] Public Contracts**
Breach of contract by government entity, rights on
**United States**
Breach of contract by government entity, rights on

To establish standing to sue the federal government for breach of contract, a plaintiff must demonstrate privity of contract with the government; in other words, the contract in question must be between the plaintiff and the government.

Cases that cite this headnote

**[9] Public Contracts**
Breach of contract by government entity, rights on
**United States**
Breach of contract by government entity, rights on

Nuclear utility that executed standard contract with Department of Energy (DOE), in which DOE agreed to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at utility's nuclear power plant, in exchange for fees that utility paid to nuclear waste fund, had standing to pursue claim against government for partial breach of contract by failing to dispose of SNF and HLW, since utility was in privity of contract with government as signatory and intended beneficiary of standard contract.

Cases that cite this headnote

**[10] Public Contracts**
Performance or Breach
**United States**
Performance or Breach

Failure to perform a contractual duty when it is due is a breach of the contract with the federal government.

Cases that cite this headnote

**[11] Public Contracts**
Delay of government and liability for damages
**United States**
Liability for damages in general

Department of Energy (DOE) was required to dispose of spent nuclear fuel (SNF) and

high-level waste (HLW) generated at utility's nuclear power plant, in exchange for fees that utility paid to nuclear waste fund, under standard contract executed by DOE and utility, where utility had paid all required fees on time and in full.

Cases that cite this headnote

[12] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

In a suit against the federal government for partial breach of contract, a plaintiff may recover damages that it already incurred.

Cases that cite this headnote

[13] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Breach of contract damages from the federal government must be sufficient to place the injured party in as good a position as it would have been had the government fully performed; however, the non-breaching party should not be placed in a better position through the award of damages than if there had been no breach.

Cases that cite this headnote

[14] **Public Contracts**
Breach of contract in general
**United States**
Breach of contract in general

Breach of contract damages are recoverable from the federal government where: (1) the damages were reasonably foreseeable by the government 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.

Cases that cite this headnote

[15] **Public Contracts**
Presumptions and burden of proof
**United States**
Presumptions and burden of proof

The plaintiff suing the federal government for breach of contract must establish each element of damages by a preponderance of the evidence; however, if damages are hard to estimate, the burden of imprecision does not fall on the innocent party.

Cases that cite this headnote

[16] **Public Contracts**
Delay
**United States**
Delay

To assess damages in cases arising out of Department of Energy's (DOE) partial breach of the standard contract with a nuclear utility, by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at the utility's nuclear power plant, Court of Federal Claims must perform a comparison between the breach and non-breach worlds.

Cases that cite this headnote

[17] **Public Contracts**
Delay
**United States**
Delay

As part of the comparison of the breach and non-breach worlds, in assessing damages in cases arising out of Department of Energy's (DOE) partial breach of the standard contract with a nuclear utility, by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at the utility's nuclear power plant, the government must move forward by pointing out the costs it believes the utility avoided because of DOE's breach; however, the utility bears the burden of persuasion with respect both to claimed costs and avoided costs.

Cases that cite this headnote

[18] **Public Contracts**
Delay
**United States**
Delay

A nuclear utility seeking breach of contract damages from the federal government must submit a hypothetical model establishing what its costs would have been in the absence of the Department of Energy's (DOE) partial breach of the standard contract with the nuclear utility by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at the utility's nuclear power plant.

Cases that cite this headnote

[19] **Public Contracts**
Delay
**United States**
Delay

As part of the comparison of the breach and non-breach worlds, in assessing damages for Department of Energy's (DOE) partial breach of the standard contract with a nuclear utility, by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at the utility's nuclear power plant, if a cost would have been incurred even in the non-breach world, it is not recoverable; likewise, a cost that would have been incurred in the non-breach world, but was not incurred in the actual world, in other words, an avoided cost, must be offset against the utility's recovery.

Cases that cite this headnote

[20] **Public Contracts**
Breach of contract
**United States**
Breach of contract

Causation is an issue of fact that plaintiff claiming the federal government breached a contract must prove by a preponderance of the evidence.

Cases that cite this headnote

[21] **Public Contracts**
Delay
**United States**
Delay

In cases arising out of Department of Energy's (DOE) partial breach of the standard contract, by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW) generated at a utility's nuclear power plant, causation requires the Court of Federal Claims to compare the breach world with a hypothetical non-breach world; thus, the utility is entitled to recover only those costs that (1) were caused by DOE's breach, and (2) the utility would not have incurred in the non-breach world.

Cases that cite this headnote

[22] **Public Contracts**
Delay
**United States**
Delay

Nuclear utility's mitigation costs incurred in amount of $3,685,112 for maintaining and operating training and records building and personnel access portal building were recoverable, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at utility's nuclear power plant, where costs were attributable to continued presence of SNF at power plant that required retention of nuclear staff and security personnel onsite, and utility would not have incurred those costs in non-breach world, as all SNF would have been removed by DOE.

Cases that cite this headnote

[23] **Public Contracts**
Delay
**United States**

Delay

Nuclear utility's mitigation costs incurred in amount of $698,255 for site consolidation, upgrades to water and septic systems at personnel access portal building, and planning to replace backup generator were recoverable, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at utility's nuclear power plant, where costs were attributable to continued presence of SNF at power plant, which required presence of nuclear staff and security personnel onsite, and utility would not have incurred those costs in non-breach world, as all of SNF would have been removed by DOE.

Cases that cite this headnote

[24] **Public Contracts**

Delay

**United States**

Delay

Nuclear utility's mitigation costs incurred in amount of $481,207 for replacement of heating, ventilation, and air conditioning (HVAC) unit and installation of new carpet in personnel access portal building were recoverable, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at utility's nuclear power plant, where costs were attributable to continued presence of SNF at power plant, which required retention of nuclear staff and security personnel onsite, and utility would not have incurred those costs in non-breach world, as all SNF would have been removed by DOE.

Cases that cite this headnote

[25] **Public Contracts**

Delay

**United States**

Delay

Nuclear utility's mitigation costs incurred in amount of $573,214 for replacement of backup generator and refurbishing parts of power plant's electrical infrastructure were recoverable, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at plant, where costs were attributable to continued presence of SNF at power plant, which required retention of nuclear staff and security personnel onsite, costs did not provide any ancillary benefit to non-nuclear functions, and utility would not have incurred costs in non-breach world, as all SNF would have been removed by DOE.

Cases that cite this headnote

[26] **Public Contracts**

Delay

**United States**

Delay

Nuclear utility's mitigation costs incurred in amount of $980,500 for operating, maintaining, and repairing interim onsite storage building (IOSB) and refurbishing SNF handling equipment stored in IOSB were recoverable, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at utility's nuclear power plant, since DOE's breach of contract was but-for cause of utility's continued operation of IOSB that would not have occurred if DOE had removed SNF, and utility reasonably stored two classes of waste and SNF handling equipment in licensed facility such as IOSB, as emergency could require removal of SNF canister.

Cases that cite this headnote

[27] **Public Contracts**

Breach of contract in general

**United States**

Breach of contract in general

A party that is mitigating damages from the federal government's breach of contract is only required to make those efforts that are fair and reasonable under the circumstances.

Cases that cite this headnote

[28] **Public Contracts**
Presumptions and burden of proof
**United States**
Presumptions and burden of proof

The party breaching a federal contract bears the burden of establishing that the non-breaching party's mitigation effort was unreasonable.

Cases that cite this headnote

[29] **Public Contracts**
Damages
**United States**
Damages

The ascertainment of damages for breach of a federal contract is not an exact science, and where responsibility for damage is clear, it is not essential that the amount thereof be ascertainable with absolute exactness or mathematical precision; it is enough if the evidence adduced is sufficient to enable the Court of Federal Claims to make a fair and reasonable approximation of the damages.

Cases that cite this headnote

[30] **Public Contracts**
Delay
**United States**
Delay

Nuclear utility's mitigation costs in amount of $86,010 for brokerage fees incurred to purchase insurance were recoverable, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at utility's nuclear power plant, since utility's methodology provided basis for fair and reasonable approximation of brokerage fees incurred due to DOE's breach.

Cases that cite this headnote

[31] **Public Contracts**
Delay
**United States**
Delay

In cases arising out of Department of Energy's (DOE) partial breach of the standard contract, by failing to dispose of spent nuclear fuel (SNF) and high-level waste (HLW)generated at a utility's nuclear power plant, plaintiffs must litigate damages in successive suits; this litigation structure limits plaintiffs' ability to collect future damages and also limits the government's ability to obtain future offsets.

Cases that cite this headnote

[32] **Public Contracts**
Delay
**United States**
Delay

Government was entitled to $682,397 offset for insurance refunds that nuclear utility received during course of five years, as damages for Department of Energy's (DOE) partial breach of standard contract by failing to dispose of spent nuclear fuel (SNF) generated at utility's nuclear power plant, even though government's requested offset was related to utility's damages incurred prior to five-year period, where government was only seeking offset that was realized in current five-year damages period.

Cases that cite this headnote

**Attorneys and Law Firms**

***739** Timothy R. Macdonald, Arnold & Porter, LLP, Denver, Colorado, Counsel for the Plaintiff.

Christopher K. Wimbush, United States Department of Justice, Civil Division, Washington, D.C., Counsel for the Government.

Damages for Partial Breach of Contract; Federal Rule of Evidence 702 (Experts); Nuclear Waste Policy Act, 42 U.S.C. §§ 10101–10270; Waste Classification, 10 C.F.R. 61.55; Licensing Requirements for Independent Storage of Spent Nuclear Fuel, 10 C.F.R. 72; Standard Contract for Disposal of Spent Nuclear Fuel, 10 C.F.R. 961.11.

**POST TRIAL MEMORANDUM OPINION AND FINAL ORDER**

BRADEN, Judge

On June 14, 1983, Sacramento Municipal Utility District ("SMUD") and other nuclear-utility plants entered into a Standard Contract, 10 C.F.R. 961.11 (1983), with the Department of Energy ("DOE"), as required by the Nuclear Waste Policy Act ("NWPA"), 42 U.S.C. §§ 10101–10270. Under the June 14, 1983 Standard Contract, the DOE had a legal obligation to begin disposing of SMUD's spent nuclear fuel ("SNF") and high-level waste ("HLW") on, or before, January 31, 1998. *See* 42 U.S.C. § 10222(a)(5)(B). The DOE, however, did not commence performance on that date and has not done so, to date.

Seventeen years ago, the United States Court of Appeals for the Federal Circuit held that DOE's failure to begin disposing of the nuclear utilities' SNF and HLW by January 31, 1998 was a partial breach of the Standard Contract. *See Maine Yankee Atomic Power Co. v. United States*, 225 F.3d 1336, 1342–43 (Fed. Cir. 2000). This Memorandum Opinion and Final Order adjudicates SMUD's June 8, 2015 Complaint, alleging that SMUD is entitled to damages for mitigation costs incurred from January 1, 2010 to June 30, 2015. [1]

[1] This is the third lawsuit that SMUD files against the United States for damages resulting from DOE's ongoing failure to perform its contractual duty.

To facilitate review of this Post Trial Memorandum Opinion And Final Order, the court has provided the following outline:

**I. FACTUAL BACKGROUND AND RELEVANT PROCEDURAL HISTORY.**

**A. *Sacramento Municipal Utility District v. United States*, Civil Action Docket No. 98–488C.**

**B. *Sacramento Municipal Utility District v. United States*, Civil Action Docket No. 09–587C.**

**C. *Sacramento Municipal Utility District v. United States*, Civil Action Docket No. 15–577C.**

**II. DISCUSSION.**

**A. Jurisdiction.**

**B. Standing.**

**C. Whether DOE Partially Breached The June 14, 1983 Standard Contract.**

***740 D. The Mitigation Costs That SMUD Is Entitled To As Damages, Because Of DOE's Partial Breach Of The June 14, 1983 Standard Contract.**

**1. Whether SMUD Is Entitled To Recover Costs Incurred To Maintain And Operate The T & R Building And PAP Building.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**2. Whether SMUD Is Entitled To Recover Costs Incurred For Site Consolidation, Upgrades To The PAP Building's Water And Septic Systems, And Planning To Replace The ISFSI Backup Generator.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**3. Whether SMUD Is Entitled To Recover Costs Incurred To Replace The HVAC Unit And Install New Carpet In The PAP Building.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**4. Whether SMUD Is Entitled To Recover Costs Incurred To Replace The ISFSI Backup Generator And Refurbish Parts Of Rancho Seco's Electrical Infrastructure.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**5. Whether SMUD Is Entitled To Recover Costs Incurred For Operating, Maintaining And Repairing The IOSB And For Refurbishing Fuel Handling Equipment Stored In The IOSB.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**6. Whether SMUD Is Entitled To Recover Brokerage Fees Incurred To Obtain ANI Insurance.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**7. Whether The Government Is Entitled To An Offset For Certain ANI Insurance Refunds That SMUD Received.**

**a. SMUD's Argument.**

**b. The Government's Response.**

**c. SMUD's Reply.**

**d. The Court's Resolution.**

**III. CONCLUSION.**

## I. FACTUAL BACKGROUND AND RELEVANT PROCEDURAL HISTORY.

### A. *Sacramento Municipal Utility District v. United States*, Civil Action Docket No. 98–488C. [2]

[2] The following Memorandum Opinions and Orders were issued in Civil Action Docket No. 98–488C: *Sacramento Mun. Util. Dist. v. United States*, 61 Fed.Cl. 438 (2004) ("*SMUD I* ") (denying the Government's motion to dismiss SMUD's takings claim and dismissing SMUD's illegal exaction claim); *Sacramento Mun. Util. Dist. v. United States*, 63 Fed.Cl. 495 (2005) ("*SMUD II* ") (determining that DOE was liable for a partial breach of the Standard Contract when it failed to begin to dispose of SMUD's SNF by January 31, 1998); *Sacramento Mun. Util. Dist. v. United States*, 70 Fed.Cl. 332 (2006) ("*SMUD III* ") (determining that SMUD was entitled to mitigation damages for certain costs incurred as a result of DOE's partial breach of the Standard Contract); *Sacramento Mun. Util. Dist. v. United States*, 74 Fed.Cl. 727 (2006) ("*SMUD IV* ") (determining that SMUD was entitled to an award of $39,796,234 in mitigation costs caused by DOE's partial breach of the Standard Contract); *Sacramento Mun. Util. Dist. v. United States*, 293 Fed.Appx. 766 (Fed. Cir. 2008) (unpublished) ("*SMUD V* ") (affirming-in-part *SMUD II–IV* and remanding for the trial court to determine causation, in light of the 1987 Annual Capacity Report, and to determine other mitigation costs); *Sacramento Mun. Util. Dist. v. United States*, 91 Fed.Cl. 9 (2009) ( "*SMUD VI* ") (on remand determining that SMUD was entitled to mitigation costs of $53,159,863, but staying entry of a final judgment, pending resolution of a related case, Docket No. 09–587C); *In re Sacramento Mun. Util. Dist.*, 395 Fed.Appx. 684, 688 (Fed. Cir. 2010) (unpublished) (denying petition for a writ of mandamus to United States Court of Federal Claims to lift stay on judgment).

SMUD is a publicly-owned municipal utility district established under the laws of California. ***741** *See SMUD III*, 70 Fed.Cl. at 339. On June 14, 1983, SMUD and other nuclear-utility plants entered into a contract (the "Standard Contract") with DOE, pursuant to the NWPA. Under the Standard Contract, DOE was legally obligated to begin disposing and storing SMUD's SNF and HLW, by January 31, 1998, and to continue to do so until disposal was complete. *See* 42 U.S.C. § 10222(a)(5)(B). In exchange for DOE's disposal and storage services,

SMUD paid fees to the Nuclear Waste Fund. *See* 42 U.S.C. § 10222(a)(5)(B).

During the 1980's, SMUD operated the Rancho Seco Nuclear Generating Station ("Rancho Seco"), a nuclear power plant located in Sacramento, California. *See SMUD III*, 70 Fed.Cl. at 339. Throughout that time, however, Rancho Seco experienced significant operating problems and extended outages. *Id.* at 340. In fact, the plant worked at full capacity for less than half of its operating life. *Id.* For this and other reasons, on June 6, 1989, the voters of Sacramento chose to shut down Rancho Seco. *Id.* Immediately thereafter, SMUD began preparing for the plant's decommissioning process. [3] *Id.* To that end, SMUD evaluated storage options for Rancho Seco's SNF and, on March 30, 1990, decided to move all of the plant's SNF from wet-pools, where it was being stored, to a "dual purpose" dry storage facility. [4] *Id.* at 341–42.

3 "Decommission means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits ... (1) Release of the property for unrestricted use and termination of the [United States Nuclear Regulatory Commission ("NRC") ] license; or (2) Release of the property under restricted conditions and termination of the license." 10 C.F.R. 50.2.

4 Dry cask storage is a method for storing spent nuclear fuel after it has cooled for at least one year. *See* UNITED STATES NUCLEAR REGULATORY COMMISSION GLOSSARY , https://www.nrc.gov/ reading-rm/basic-ref/glossary/dry-cask-storage.html (last visited Feb. 23, 2017). The fuel is sealed in casks that are welded or bolted closed and surrounded by steel, concrete, lead, or other material to provide leak-tight containment and radiation shielding. *See id.* Dual-purpose canisters are designed for dry storage, but also allow SNF to be transported within a cask unit to a disposal site. *See SMUD III*, 70 Fed.Cl. at 341 n.11.

DOE did not begin to dispose of SMUD's SNF and HLW by January 31, 1998, as required by the Standard Contract. [5] *Id.* at 353. Accordingly, on June 9, 1998, SMUD filed a Complaint ("6/9/1998 Compl.") in Civil Action Docket No. 98–488C, alleging that DOE's failure to begin storing and disposing of SMUD's SNF breached the Standard Contract. 6/9/1998 Compl. at ¶ 1. SMUD sought mitigation damages for a period that eventually spanned from January 1, 1992 to December 31, 2003. *See SMUD III*, 70 Fed.Cl. at 356.

5 To date, DOE has not disposed of or stored any of SMUD's SNF or HLW. Answer at ¶ 22, *Sacramento Municipal Utility District v. United States*, No. 15–577 (Fed. Cl. July 30, 2015), ECF No. 7 ("Admits the allegation ... that the DOE did not begin disposing of SNF and HLW from commercial nuclear utilities, including SMUD, by January 31, 1998, under the standard contract, and has yet to do so.").

On August 31, 2000, the United States Court of Appeals for the Federal Circuit held that DOE breached the Standard Contract in a related case, because DOE did not meet its contractual obligation to begin accepting nuclear waste before January 31, 1998. *See Maine Yankee Atomic Power*, 225 F.3d at 1343. On January 19, 2005, the United States Court of Federal Claims determined that DOE breached the Standard Contract, because *Maine Yankee Atomic Power* "settled the legal issue of whether [DOE's] failure to begin accepting nuclear waste by January 31, 1998, constituted a breach ... [.]" *SMUD II*, 63 Fed.Cl. at 502–03.

On March 31, 2006, the court also determined that SMUD was entitled to damages for certain costs incurred from May 15, 1997 to December 31, 2003. *See SMUD III*, 70 Fed.Cl. at 332. Specifically, the court found that SMUD was entitled to recover costs for:

- dry storage of SNF, *id.* at 367;
- labor severance and recruiting, *id.* 369;
- delays to complete the Independent Spent Fuel Storage Installation ***742** ("ISFSI"), [6] required to implement dry storage of SNF, *id.*;
- storing failed SNF, *id.* at 370;
- operation and maintenance of the ISFSI, *id.* at 371;
- preparation, packaging, inspection, and loading of SNF, *id.* at 373.

But, the court determined that SMUD was not entitled to recover costs related to:

- SMUD's decision to store SNF in dual purpose transportable casks, *id.* at 374;

- contracts, or other legal obligations, related to the dry storage project that SMUD incurred prior to May 15, 1997, *id.*;
- storage of Greater Than Class C ("GTCC") waste, [7] *id.*;
- savings accrued when SMUD transferred the Rancho Seco SNF from wet-pool storage to dry storage, *id.* at 375;
- internal labor, except for work performed on the dry storage project, *id.* at 376;
- overhead costs, *id.* at 377;
- on-site drop testing, *id.* at 378.

6 An ISFI is a "complex designed and constructed for the interim storage of spent nuclear fuel ... and other radioactive materials associated with spent fuel[.]" 10 C.F.R. 72.3.

7 GTCC waste means "low-level radioactive waste that exceeds the concentration limits of radionuclides established for Class C waste in [10 C.F.R.] 61.55[.]" 10 C.F.R. 72.3.

On March 31, 2006, the court also entered an Order Requesting Supplemental Expert Testimony, because the court could not ascertain SMUD's damages with reasonable certainty based on the record. Order Requesting Supplemental Expert Testimony at 1, *Sacramento Municipal Utility District v. United States*, 70 Fed.Cl. 332 (2006), ECF No. 354. Thereafter, the parties supplemented the record and, on December 1, 2006, the court determined that SMUD was entitled to an award of $39,796,234. *See SMUD IV*, 74 Fed.Cl. at 735. Thereafter, SMUD and the Government filed cross-appeals. [8]

8 In *SMUD III*, the court found that the parties' evidence regarding the Standard Contract's acceptance rate, *i.e.* the rate at which DOE was obligated to accept SNF from SMUD, was highly speculative. *See SMUD III*, 70 Fed.Cl. at 375 n.40. For this reason, the court declined to determine an acceptance rate. *Id.*

On August 7, 2008, the United States Court of Appeals for the Federal Circuit held that "the Standard Contract [required] the [DOE] to accept SNF and HLW in accordance with the 1987 annual capacity report ["ACR"]." *SMUD V*, 293 Fed.Appx. at 771. That appellate court also held that the United States Court of Federal Claims erred in granting the Government offsets for costs related to internal labor, dual-purpose caskets, and nonfuel storage, in the amount of $13,363,629. *Id.* at 773–75. Accordingly, Civil Action Docket No. 98–488C was remanded, with instructions that the trial court apply the 1987 ACR acceptance rate to assess causation and correct its offset determinations. *See id.* at 772.

On remand, the court applied the 1987 ACR acceptance rate and determined that SMUD was entitled to $39,796,234 in mitigation costs. *See SMUD VI*, 91 Fed.Cl. at 18. Moreover, in light of the appellate court's holding that the Government should not receive offsets related to internal labor, dual-purpose caskets and nonfuel storage, the court determined that SMUD was entitled to an additional $13,363,629. *Id.* Finally, the court denied the Government's request for an offset related to savings that SMUD allegedly realized between 2004 and 2008. *Id.* at 19. The court found that, on September 4, 2009, SMUD filed a Complaint in Civil Action Docket No. 09–587C, seeking damages from January 1, 2004 onward and determined that any offset realized after January 1, 2004, therefore, should be adjudicated in that case. *Id.* at 19. The court, however, stayed judgment in Civil Action Docket No. 98–488C, pending the court's resolution of Civil Action Docket No. 09–587C. *Id.*

On March 12, 2010, SMUD filed a Petition For A Writ Of Mandamus, requesting that the United States Court of Appeals for the Federal Circuit order the court to lift the stay in Civil Action Docket No. 98–488C. On September 16, 2010, SMUD's Petition was denied. *See In re Sacramento Mun. Util. Dist.*, 395 Fed.Appx. at 688.

***743 B. *Sacramento Municipal Utility District v. United States*, Civil Action Docket No. 09–587C.**

On September 4, 2009, SMUD filed a Complaint ("9/4/2009 Compl.") in Civil Action Docket No. 09–587C alleging that, "[a]s a direct and proximate result of the [G]overnment's partial breach of the [Standard] Contract ... SMUD has suffered [ ] damages from January 1, 2004 forward, and will continue to suffer damages in the future." 9/4/2009 Compl. at ¶ 23. On May 17, 2011, the court issued a Memorandum Opinion and Order, granting SMUD leave to supplement the September 4, 2009 Complaint to allege a claim for damages incurred through December 31, 2009. *See Sacramento Mun. Util.*

*Dist. v. United States*, 98 Fed.Cl. 495, 499 (2011) ("*SMUD VII* ").

From October 24, 2011 to October 27, 2011, the court held a trial in Washington, D.C., to adjudicate the amount of damages that SMUD was entitled to recover for the period from January 1, 2004 to December 31, 2009. On January 31, 2013, the court issued a Memorandum Opinion and Final Order in Civil Action Docket No. 09–587C, determining that SMUD was entitled to $53,159,863 for costs incurred to mitigate the Government's partial breach of the Standard Contract from 1992 to 2003, plus $20,703,595 for costs incurred from 2004 to 2009. *See Sacramento Mun. Util. Dist. v. United States*, 109 Fed.Cl. 660, 708 (2013) ("*SMUD VIII* "). The court also determined that the Government was entitled to an offset of $34,987,913 for wet pool costs that SMUD avoided from 2004 to 2008. *Id.* Accordingly, the court awarded SMUD a total of $38,845,398 for the period between 1992 and 2009. *Id.* The parties filed cross-appeals.

On June 20, 2014, the United States Court of Appeals for the Federal Circuit held that the United States Court of Federal Claims erred by applying an offset for the 2004–2009 damages period, to an earlier final judgment for the 1992–2003 damages period. *See Sacramento Mun. Util. Dist. v. United States*, 566 Fed.Appx. 985, 997 (Fed. Cir. 2014) (unpublished) ("*SMUD IX* "). Accordingly, the appellate court reversed the combined judgment of $38,845,398 for the 1992–2009 period and reinstated the prior $53,159,863 award for mitigation costs incurred between 1992 and 2003. *Id.* at 986. Moreover, the appellate court vacated the damages award for 2004 to 2009 and remanded the case to the trial court for consideration of SMUD's argument that, in light of the Standard Contract's "Exchanges" provision, SMUD's SNF would have been entirely removed before January 1, 2004, in the non-breach world. [9]

9 The "Exchanges" provision gave utilities the option to exchange or swap acceptance slots to adjust delivery schedules, subject to the approval of DOE. *See SMUD IX*, 566 Fed.Appx. at 987.

On remand, the court determined that, in the non-breach world, DOE would have removed all of Rancho Seco's SNF by January 1, 2004. *See Sacramento Mun. Util. Dist. v. United States*, 120 Fed.Cl. 270, 279 (2015) ("*SMUD X* "). And, SMUD was entitled to $20,703,595 in mitigation costs for the period between January 1, 2004 and December 31, 2009. *Id.* at 282. In addition, the court awarded SMUD an additional $1,816,964 for various other fees. *Id.*

### C. *Sacramento Municipal Utility District v. United States*, Civil Action Docket No. 15–577C. [10]

10 The underlying facts in Docket No. 15–577C were set forth in *SMUD III*, *SMUD IV*, *SMUD VIII*, and *SMUD X*. The relevant facts described herein were derived from: the June 8, 2015 Complaint ("6/8/2015 Compl."); the July 30, 2015 Answer ("7/30/2015 Answer"); evidence adduced at a trial that took place from October 4–5, 2016 in Washington, D.C. ("TR at 1–352"); SMUD's exhibits, introduced during trial ("PX 1–53," "PD 1–13, 101–105"); and the Government's exhibits, introduced during trial ("DX 1–73").

On June 8, 2015, SMUD filed a Complaint in the United States Court of Federal Claims in this case, Civil Action Docket No. 15–577C, alleging a partial breach of the Standard Contract (6/8/2015 Compl. at ¶ 28) and seeking "damages incurred beginning January 1, 2010 and continuing through a date prior to trial, at least through June 1, 2015." 6/8/2015 Compl. at ¶ 13. On July 30, 2015, the Government filed an Answer (7/30/2015 Answer). ECF No. 7.

***744** On September 21, 2015, the parties filed a Joint Preliminary Status Report, proposing two different discovery schedules. ECF No. 8. On October 5, 2015, the court convened a Status Conference to discuss a schedule acceptable to both parties. ECF No. 10. On October 28, 2015, the court issued a Scheduling Order, that set the close of fact discovery for June 17, 2016 and a trial date for October 2016. ECF No. 11.

On April 5, 2016, the Government filed a Motion To Extend Discovery And Stay Certain Deadlines, that SMUD opposed. ECF No. 15. On April 13, 2016, the court convened a Status Conference to address the April 5, 2016 Motion. ECF No. 17. On April 18, 2016, the court issued an Amended Scheduling Order, denying the Government's request to stay certain deadlines, but extending discovery until July 18, 2016. ECF No. 18. The court also scheduled trial for October 4–6, 2016, in Washington, D.C. ECF No. 18.

On July 29, 2016, SMUD submitted a Witness List and Exhibit List. ECF Nos. 22–23. On that same day, SMUD filed a Memorandum Of Contentions Of Fact And Law, to advise the court that SMUD claimed $29,555,559 in damages, of which the Government did not dispute $22,508,343. ECF No. 24. SMUD also filed a Motion For Partial Summary Judgment, pursuant to Rule of the United States Court of Federal Claims ("RCFC") 56, arguing that the court should grant SMUD summary judgment as to the $22,508,343 claimed by SMUD and not disputed by the Government ("Pl. Mot."). ECF No. 25.

On August 15, 2016, the Government filed a Response to the July 29, 2016 Motion For Partial Summary Judgment, confirming that the Government did not contest $22,362,864 of the damages SMUD claimed ("Gov't Resp."). ECF No. 27. But, the Government argued that the court can only enter a partial judgment when, "an action presents more than one claim for relief." Gov't Resp. at 2. In this case, however, the disputed and undisputed damages constitute a single claim for relief. Gov't Resp. at 2. Therefore, the court is required as a matter of law, to deny the July 29, 2016 Motion For Partial Summary Judgment. Gov't Resp. at 2.

On August 15, 2016, the Government also filed a Motion To Modify the April 18, 2016 Scheduling Order. ECF No. 29. On August 19, 2016, the court denied the Government's Motion to modify the April 18, 2016 Scheduling Order. On that same day, the Government filed a Witness List, Exhibit List, and Memorandum Of Contentions Of Fact And Law. ECF Nos. 31–33.

On September 8, 2016, SMUD filed a Reply in support of its July 29, 2016 Motion For Partial Summary Judgment, arguing that the Government's definition of a "claim" is overly restrictive, elevating form over substance ("Pl. Reply"). ECF No. 37. On September 14, 2016, the Government filed an Amended Exhibit List, correcting the dates and descriptions of several exhibits. ECF No. 40.

On September 28, 2017, the court issued a Pretrial Order, instructing the parties to file the written direct examination testimony of their expert witnesses on the next day. ECF No. 41. Pursuant to the Pretrial Order, on September 29, 2016, the parties filed the written direct testimony of their experts. ECF Nos. 42–43. On September 30, 2016, SMUD filed an Amended Exhibit List and, on October 3, 2016, a Second Amended Exhibit List. ECF Nos. 44–45.

On October 4–5, 2016, the court held a trial to determine the damages that SMUD incurred between January 1, 2010 and June 31, 2016, due to DOE's ongoing partial breach of contract. ECF Nos. 52, 54. During trial, the court instructed each party to submit supplemental briefing regarding SMUD's July 29, 2016 Motion For Partial Summary Judgment. TR at 24. On October 7, 2016, the Government filed a Supplemental Brief ("Gov't Supp. Br."). ECF No. 46.

On October 11, 2016, the Government filed a Second Amended Exhibit List. ECF. No. 47. On October 19, 2016, SMUD filed a Third Amended Exhibit List. ECF No. 48. On October 20, 2016, SMUD filed a Response to the October 7, 2016 Supplemental Brief ("Pl. Supp. Br."). ECF No. 49.

On November 14, 2016, SMUD filed a Post Trial Brief ("Pl. Post Tr. Br."). ECF No. 55. And, on December 9, 2016, the Government filed a Post Trial Response Brief ("Gov't Post ***745** Tr. Resp."). ECF No. 56. On December 23, 2016, SMUD filed a Reply to the Government's December 9, 2016 Post–Trial Brief ("Pl. Post Tr. Reply"). ECF No. 57.

## II. DISCUSSION.

### A. Jurisdiction.

**[1]** **[2]** **[3]** The United States Court of Federal Claims has jurisdiction under the Tucker Act, 28 U.S.C. § 1491, "to render judgment upon any claim against the United States founded either upon the Constitution, or any Act of Congress or any regulation of an executive department, or upon any *express or implied contract* with the United States, or for liquidated or unliquidated damages in cases not sounding in tort." 28 U.S.C. § 1491(a)(1) (emphasis added). The Tucker Act, however, is "a jurisdictional statute; it does not create any substantive right enforceable against the United States for money damages. ... [T]he Act merely confers jurisdiction upon [the United States Court of Federal Claims] whenever the substantive right exists." *United States v. Testan*, 424 U.S. 392, 398, 96 S.Ct. 948, 47 L.Ed.2d 114 (1976). To pursue a substantive right under the Tucker Act, a plaintiff must identify and plead an independent *contractual relationship*, constitutional provision, federal statute and/or executive

agency regulation *that provides a substantive right to money damages*. *See Todd v. United States*, 386 F.3d 1091, 1094 (Fed. Cir. 2004) (emphasis added). In a breach of contract case, "the money-mandating requirement for Tucker Act jurisdiction normally is satisfied by the presumption that money damages are available for breach of contract, with no further inquiry being necessary." *Holmes v. United States*, 657 F.3d 1303, 1314 (Fed. Cir. 2011).

**[4]** In this case, the June 8, 2015 Complaint alleges that: (1) SMUD entered into an express contract with DOE on June 14, 1983; (2) DOE breached, and continues to breach, the June 14, 1983 Contract; and (3) SMUD is entitled to damages for the ongoing breach. 6/8/2015 Compl. at ¶¶ 1, 13, 28. Because SMUD's claims are based on the alleged breach of a contractual relationship with the Government, the court has determined that it has jurisdiction to adjudicate those claims. *See Holmes*, 657 F.3d at 1314.

**B. Standing.**

**[5]** **[6]** **[7]** The United States Supreme Court has held that "the question of standing is whether the litigant is entitled to have the court decide the merits of the dispute or of particular issues." *Warth v. Seldin*, 422 U.S. 490, 498, 95 S.Ct. 2197, 45 L.Ed.2d 343 (1975). Standing must be determined "as of the commencement of suit[.]" *Rothe Dev. Corp. v. Dep't of Def.*, 413 F.3d 1327, 1334 (Fed. Cir. 2005) (quoting *Lujan v. Defs. of Wildlife*, 504 U.S. 555, 570 n.5, 112 S.Ct. 2130, 119 L.Ed.2d 351 (1992)). "The party invoking federal jurisdiction bears the burden of establishing [standing]." *Lujan*, 504 U.S. at 561, 112 S.Ct. 2130.

**[8]** To establish standing to sue the Government for breach of contract, a plaintiff must demonstrate privity of contract with the Government. *See Anderson v. United States*, 344 F.3d 1343, 1351 (Fed. Cir. 2003) ("To have standing to sue the sovereign on a contract claim, a plaintiff must be in privity of contract with the United States."). In other words, the contract in question must be between the plaintiff and the Government. *See Ransom v. United States*, 900 F.2d 242, 244 (Fed. Cir. 1990) ("To maintain a cause of action pursuant to the Tucker Act that is based on a contract, the contract must be between the plaintiff and the [G]overnment.").

**[9]** In this case, it is undisputed that SMUD was a signatory and intended beneficiary of the June 14, 1983 Standard Contract. 7/30/2015 Answer at ¶ 1 ("[The Government] [a]dmits that in 1983, SMUD entered into a standard contract ... for the disposal of [SNF] and/or [HLW], by [DOE]."). Therefore, the court has determined that SMUD is in privity of contract with the Government. Accordingly, SMUD has standing to pursue the breach of contract claim alleged in the June 8, 2015 Complaint.

**C. Whether DOE Partially Breached The June 14, 1983 Standard Contract.**

**[10]** **[11]** "Failure to perform a contractual duty when it is due is a breach of the contract." ***746** *Winstar Corp. v. United States*, 64 F.3d 1531, 1545 (Fed. Cir. 1995), *aff'd* 518 U.S. 839, 116 S.Ct. 2432, 135 L.Ed.2d 964 (1996). The United States Court of Appeals for the Federal Circuit has held that the Standard Contract that DOE entered into with SMUD and other nuclear-utility plants, under the NWPA, required DOE to "dispose of the [plants' SNF and HLW] beginning no later than January 31, 1998." *Maine Yankee Atomic Power*, 225 F.3d at 1337 (internal quotation marks omitted). In this case, the parties do not dispute that, to date, "DOE has failed to begin disposing of SNF" and that, "SMUD [has] paid all required fees on time and in full." 7/30/2015 Answer at ¶ 2. Therefore, the court has determined that DOE partially breached the June 14, 1983 Standard Contract. *Cf. Maine Yankee Atomic Power*, 225 F.3d at 1343 ("[T]he parties do not dispute that [plaintiff] has paid all the contract fees and ... that DOE has not begun accepting, transporting, and disposing of [plaintiff's] SNF. Accordingly, DOE has breached the contract." (internal quotation marks omitted)).

**D. The Mitigation Costs That SMUD Is Entitled To As Damages, Because Of DOE's Partial Breach Of The June 14, 1983 Standard Contract.**

**[12]** **[13]** In a suit for partial breach of contract, a plaintiff may recover damages that it already incurred. *See Ind. Mich. Power Co. v. United States*, 422 F.3d 1369, 1376 (Fed. Cir. 2005) ("[A] claimant may not recover ... prospective damages for anticipated future nonperformance resulting from the same partial breach."). Breach of contract damages must be "sufficient to place the injured party in as good a position as it would have been had the breaching party fully performed." *Id.* at 1373. But, "[the] non-breaching party should not be placed

in a better position through the award of damages than if there had been no breach." *Bluebonnet Sav. Bank, F.S.B. v. United States*, 339 F.3d 1341, 1345 (Fed. Cir. 2003).

**[14]** **[15]** Breach of contract damages are "recoverable where: (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;[11] and (3) the damages are shown with reasonable certainty." *Ind. Mich. Power Co.*, 422 F.3d at 1373. The plaintiff must establish each element by a preponderance of the evidence. *Energy Capital Corp. v. United States*, 302 F.3d 1314, 1325 (Fed. Cir. 2002). If damages are hard to estimate, however, "the burden of imprecision does not fall on the innocent party." *LaSalle Talman Bank v. United States*, 317 F.3d 1363, 1374 (Fed. Cir. 2003).

11 The United States Court of Appeals for the Federal Circuit prefers the "but for" causation test—whether the breach of contract was the but-for cause of plaintiff's damages—over the "substantial factor" causation test—whether the breach was a substantial factor in causing plaintiff's damages. *See Yankee Atomic*, 536 F.3d at 1272. Nonetheless, the appellate court has refrained "from reversing trial courts that [apply] the substantial factor test in ... SNF cases." *Id.*

**[16]** **[17]** **[18]** To assess damages in cases arising out of DOE's partial breach of the Standard Contract, the court must perform a "comparison between the breach and non-breach worlds." *Yankee Atomic Elec. Co. v. United States*, 536 F.3d 1268, 1273 (Fed. Cir. 2008). As part of this comparison, the Government "must move forward by pointing out the costs it believes the [nuclear utility] plaintiff avoided because of [DOE's] breach[.]" *S. Nuclear Operating Co. v. United States*, 637 F.3d 1297, 1304 (Fed. Cir. 2011). The nuclear utility-party, however, bears the burden of persuasion with respect both to claimed costs and avoided costs. *Id.* Therefore, "a plaintiff seeking damages must submit a hypothetical model establishing what its costs would have been in the absence of breach." *Energy Nw. v. United States*, 641 F.3d 1300, 1305 (Fed. Cir. 2011); *see also S. Nuclear*, 637 F.3d at 1304 ("[B]ecause plaintiffs ... are seeking expectancy damages, it is incumbent upon them to establish a plausible 'but-for' world.") (quoting *Yankee Atomic*, 536 F.3d at 1273) (internal quotation marks omitted)).

**[19]** "If a cost would have been incurred even in the non-breach world, it is not recoverable." *Energy Nw.*, 641 F.3d at 1307. Likewise, a cost that would have been incurred in ***747** the non-breach world, but was not incurred in the actual world—*i.e.*, an avoided cost—must be offset against a plaintiff's recovery. *See Carolina Power & Light Co. v. United States*, 573 F.3d 1271, 1277 (Fed. Cir. 2009) (differentiating between "avoided" and "deferred" costs).

In this case, SMUD seeks $29,549,558 in damages for mitigation costs incurred from January 1, 2010 to June 30, 2015, caused by DOE's ongoing breach of the Standard Contract. Pl. Post Tr. Br. at 1. The Government objects only to $7,041,215 of that amount, because SMUD did not carry its burden to establish, by a preponderance of the evidence, that SMUD is entitled to costs associated with:

- maintenance of the Training and Records (T & R),[12] and Personnel Access Portal ("PAP")[13] buildings;
- site consolidation, upgrades to the PAP building's water and septic systems, and planning to replace the ISFSI backup generator;
- replacing the PAP building's heating, ventilation and air-conditioning ("HVAC"), and carpets;
- replacing the ISFSI's backup generator, and refurbishing certain parts of Rancho Seco's electrical infrastructure;
- maintenance of the Interim Onsite Storage Building ("IOSB")[14] and refurbishing the fuel handling equipment stored in the IOSB;
- American Nuclear Insurers ("ANI") insurance brokerage fees; and
- ANI Premium Costs.

Gov't Post Tr. Br. at 9, 18, 20, 24.

12 The T & R building, a five-story building constructed in the 1980s, housed offices for three Rancho Seco staff members and twenty security guards. TR at 64–65 (Testimony of Mr. Einar Ronningen).

13 The PAP building was "repurposed from an existing security building to become the main office building, providing work space for all on-site non-security personnel, support space for the on-site security personnel, as well as a location for a qualified vault for

site records." PX 52 at 25 (Written Direct Testimony of Mr. Kenneth P. Metcalfe).

14 "[T]he IOSB was used to store contaminated spent fuel handling equipment, which SMUD maintains for use in ongoing spent fuel transfer campaigns, and which SMUD intends to use to move spent fuel during SMUD's Part 72 relicensing process, if necessary." PX 52 at 22–23 (Metcalfe). Moreover, SMUD stored Class B and Class C waste in the IOSB until 2014. PX 52 at 23 (Metcalfe).

**1. Whether SMUD Is Entitled To Recover Costs Incurred To Maintain And Operate The T & R Building And PAP Building.**

**a. SMUD's Argument.**

SMUD argues that it is entitled to recover $3,685,112 for maintenance of the T & R and PAP buildings from 2010 to 2015, because these costs are attributable to the presence of SNF at Rancho Seco. Pl. Post Tr. Br. at 6–7. The court has determined in prior litigation that, in the non-breach world, DOE would have removed all of SMUD's SNF by 2004 and SMUD would have completely exited the nuclear industry by 2009. Pl. Post Tr. Br. at 2. For these reasons, the court awarded SMUD maintenance and operations costs in Civil Action Docket No. 09–587C, and should do so again in this case. Pl. Post Tr. Br. at 6.

The evidence adduced at trial proves that SMUD's site operations costs are attributable to DOE's ongoing failure to remove Rancho Seco's SNF. Pl. Post Tr. Br. at 7. Mr. Ronningen [15] testified that SMUD's site operations costs were related to operating and maintaining facilities used by personnel that support SNF storage. Pl. Post Tr. Br. at 8. These costs were "required because of the presence of the spent nuclear fuel and the staff [at Rancho Seco] safely managing it." Pl. Post Tr. Br. at 7 (quoting TR at 61–62, 85 (Ronningen)).

15 Mr. Einar Ronningen is SMUD's senior representative at the Rancho Seco site. TR at 41. In that capacity, he is responsible for the safe storage of spent nuclear fuel. TR at 41 (Ronningen).

At trial, the Government did not refute Mr. Ronningen's testimony. In fact, the Government's expert witness, Mr. Warren Brewer, [16] agreed that it is necessary to have security ***748** personnel and management employees to guard and manage the SNF stored at Rancho Seco, and they need office space that must be maintained. TR at 243 (Brewer). Mr. Brewer also agreed that the costs of maintaining the nuclear records vault and the security gate at the entrance of the Rancho Seco site are attributable to the presence of SNF. TR at 246–47 (Brewer).

16 Mr. Warren Keith Brewer is the President of ABZ, Incorporated, an engineering consulting company. TR at 232. Mr. Brewer has a Bachelor of Science degree in electrical engineering from Louisiana Tech University and a Masters of Science degree in nuclear engineering from the Massachusetts Institute of Technology. TR at 233. In addition, Mr. Brewer has taken graduate-level courses at the Bettis Reactor Engineering School. TR at 233. Mr. Brewer has worked in the nuclear industry for over forty years. TR at 232. He began his nuclear career with the United States Navy, as an employee of the Division of Labor Reactors. TR at 233. After ten years, he moved to a consulting company named Picard, Lowe and Garrick. TR at 234. Mr. Brewer left Picard, Lowe and Garrick to begin ABZ, Incorporated. TR at 234. In his work as a nuclear engineering consultant, the United States Court of Federal Claims has qualified Mr. Brewer as an expert in nuclear engineering and nuclear decommissioning. TR at 239. During trial, the Government proffered Mr. Brewer as an expert in nuclear engineering—that includes SNF management, nuclear power plant systems, NRC regulations, and nuclear power plant modifications—as well as nuclear decommissioning. TR at 241. SMUD did not object to Mr. Brewer's qualifications. TR at 241. Accordingly, the court has determined that Mr. Brewer is an expert in his respective field and qualified to testify as such. *See* Fed. R. Evid. 702.

**b. The Government's Response.**

The Government challenges $3,663,129 of the costs claimed by SMUD for maintenance and operation of the T & R building and PAP building, because those facilities support personnel that perform non-nuclear activities at Rancho Seco. Gov't Post Tr. Br. at 9–10. Therefore, the maintenance of these buildings is not related to DOE's partial breach of the Standard Contract. Gov't Post Tr. Br. at 9. In addition, SMUD did not "prove the extent to which [its] incurred costs differ from the costs [it] would have incurred in the non-breach world," because SMUD failed to present evidence of what its maintenance and

operations costs would have been if DOE performed on the Standard Contract. Gov't Post Tr. Br. at 11 (citing *Energy Nw.*, 641 F.3d at 1306). Mr. Ronningen testified that SMUD's claim includes costs that "he determined had any connection, either directly or indirectly, to the presence of [SNF at Rancho Seco]." Gov't Post Tr. Br. at 12. But, Mr. Ronningen failed to consider whether costs for the same or similar activities would have been incurred if DOE had disposed of SMUD's SNF by 2004. Gov't Post Tr. Br. at 12.

Moreover, to the extent that SMUD argues that "it has satisfied its causation burden because ... no buildings or personnel would be located at the Rancho Seco Industrial Facility in the non-breach world, its argument conflicts with SMUD's continued [use] of the site for non-SNF-related activities." Gov't Post Tr. Resp. at 14. As Mr. Ronningen testified, in the non-breach world, SMUD's switchyard[17] and solar power plant, Western Area Power Administration's ("WAPA")[18] communications equipment, and the Cosumnes Gas-fired Power Plant would still be located at Rancho Seco. Gov't Post Tr. Resp. at 14 (citing TR at 140, 144, 171 (Ronningen)).

17 The switchyard is the "infrastructure that was installed to take the electricity that Rancho Seco generated and put it on the distribution grid." TR at 119 (Ronningen).

18 WAPA is an agency within the United States Department of Energy that transmits and sells hydropower across fifteen central and western states. *See* WESTERN AREA POWER ADMINISTRATION HISTORY, https://www.wapa.gov/About/history/Pages/History.aspx (last visited Feb. 23, 2017).

**c. SMUD's Reply.**

SMUD replies that the evidence presented at trial established that, in the non-breach world, SMUD would not have incurred maintenance and operation costs for the T & R building and PAP building from 2010 to 2015. Pl. Post Tr. Reply at 3. Mr. Ronningen testified that Rancho Seco is no longer a functioning power plant, so the only employees located there are nuclear staff. Pl. Post Tr. Reply at 5 (citing TR at 69 (Ronningen)). The nuclear staff is at Rancho Seco solely to oversee the safe storage of SNF. Pl. Post Tr. Reply at 3 (citing TR at 65 (Ronningen)). Moreover, it is undisputed that these employees are necessary to "manage, operate, and guard the SNF, as well as ensure compliance with ***749** NRC regulations, including [maintenance of] a nuclear record vault [onsite]." Pl. Post Tr. Reply at 5 (citing TR at 243–45 (Brewer)). The T & R building and PAP building house the offices of Rancho Seco's nuclear staff and are not used by any other SMUD employee. Pl. Post Tr. Reply at 5 (citing TR at 69 (Ronningen)). This evidence demonstrates that, in the non-breach world, SMUD would not have incurred costs to maintain the T & R building and PAP building.

**d. The Court's Resolution.**

**[20]** **[21]** Causation is an issue of fact that plaintiff must prove by a preponderance of the evidence. *See Energy Capital*, 302 F.3d at 1332 ("In contract cases, causation, foreseeability, and certainty are questions of fact."); *id.* at 1325 (instructing that plaintiff must prove causation by a preponderance of the evidence to recover expectancy damages in a breach of contract claim). In cases arising out of DOE's partial breach of the Standard Contract, causation requires the court to compare the breach world with a hypothetical non-breach world. *See Yankee Atomic*, 536 F.3d at 1273. Plaintiff is entitled to recover only those costs that (1) were caused by DOE's breach, *Energy Capital*, 302 F.3d at 1325, and (2) Plaintiff would not have incurred in the non-breach world, *Energy Nw.*, 641 F.3d at 1307.

**[22]** The Government argues that SMUD is not entitled to recover costs incurred to maintain the T & R and PAP buildings, because those costs benefit SMUD's non-nuclear business objectives and provide only incidental benefits to the storage of SNF. Gov't Post Tr. Resp. at 9–10. In other words, SMUD has failed to establish that its claimed costs are attributable to the continued presence of SNF at Rancho Seco. The weight of the evidence, however, cuts against the Government's argument. At trial, Mr. Ronningen testified that in 2010 the T & R building contained offices for nuclear staff and security officers, responsible for guarding Rancho Seco's SNF. TR at 65 (Ronningen). No one else occupied the building. TR at 65 (Ronningen). After 2010, the nuclear staff and security officers were transferred to the PAP building. TR at 67–68 (Ronningen). The PAP building housed only these employees. TR at 81 (Ronningen). At the time of the

move, SMUD stopped maintaining the T & R building and, in 2015, demolished it. TR at 81, 86 (Ronningen).

The Government did not produce affirmative evidence to rebut Mr. Ronningen's testimony. But, during cross-examination, Mr. Ronningen admitted that the PAP building served as a checkpoint for the entire Rancho Seco complex and that non-nuclear personnel sometimes passed through there. TR at 167 (Ronningen). The witness, however, clarified that the PAP building likely remained a checkpoint, because the nuclear staff and security officers were located there. TR at 167 (Ronningen). In the non-breach world, the PAP building would have been unoccupied. TR at 81 (Ronningen). Moreover, the Government's own witness admitted that costs for maintaining and operating offices for Rancho Seco's nuclear staff and security force are attributable to DOE's partial breach of the Standard Contract. TR at 246–47 (Brewer). Therefore, the court has determined that SMUD established that the costs incurred to maintain and operate the T & R and PAP buildings are attributable to the continued presence of SNF at Rancho Seco.

In addition, SMUD has established that it would not have incurred costs to maintain and operate the T & R and PAP buildings in the non-breach world. Mr. Ronningen testified that the T & R building was occupied only by nuclear staff. TR at 65 (Ronningen). And, that virtually all of the costs associated with maintaining and operating the T & R building seized after those employees moved out. TR at 86 (Ronningen). In fact, SMUD demolished the T & R building a short time after the nuclear staff was transferred to the PAP building. TR at 81 (Ronningen). The Government did not rebut this testimony. Instead, Mr. Brewer admitted that the presence of SNF at Rancho Seco made it necessary to have nuclear staff and security personnel onsite. TR at 243 (Brewer). And, that these employees need offices with functioning lights, heating and ventilation, running water, bathrooms, computers and internets access, and fire safety equipment. TR at 244–45 (Brewer). In other words, the nuclear staff requires an operational office building and ***750** that office building must be maintained. Based on the testimony of Mr. Ronningen and Mr. Brewer, the court has determined that, in the non-breach world, SMUD would not have incurred costs to maintain and operate the T & R building after 2004, when all of Rancho Seco's SNF would have been removed.

Mr. Ronningen also testified that the PAP building would have been unoccupied in the non-breach world. TR at 81 (Ronningen). In addition, the PAP building does not provide any support to SMUD's Backup Control Center ("BCC"), [19] switchyard or solar power plant. TR at 119, 121 (Ronningen). The Government produced evidence that the PAP building serves as a security checkpoint for the entire Rancho Seco facility. TR at 167 (Ronningen). But, as mentioned above, Mr. Ronningen explained that the PAP building only served as a de facto checkpoint, because the nuclear staff and security personnel are already located there. TR at 167 (Ronningen). Therefore, the court has determined that in the non-breach world, SMUD would not have incurred costs to maintain and operate the PAP building.

19 "SMUD maintains a backup control center at [Rancho Seco], which ensures that in the event of an emergency at SMUD's headquarters in downtown Sacramento ... the utility will still be able to operate its grid and provide power to its customers." TR at 27–28 (Ronningen).

For these reasons, the court has determined that SMUD is entitled to recover $3,685,112 for costs incurred to maintain and operate the T & R and PAP buildings from January 1, 2010 to June 30, 2015.

### 2. Whether SMUD Is Entitled To Recover Costs Incurred For Site Consolidation, Upgrades To The PAP Building's Water And Septic Systems, And Planning To Replace The ISFSI Backup Generator.

#### a. SMUD's Argument.

SMUD argues that it is entitled to recover $698,255 for site consolidation costs, because those costs are attributable to DOE's partial breach of the June 14, 1983 Standard Contract and are reasonable. Pl. Post Tr. Br. at 13. Specifically, SMUD claims $567,505 for costs incurred moving Rancho Seco's nuclear staff from the T & R building to the PAP building and $126,114 for work done to the PAP building's water and septic systems after the move. Pl. Post Tr. Br. at 13–14. SMUD also claims $4,637 for planning that was necessary to replace the ISFSI backup generator, required by NRC regulations. Pl. Post Tr. Br. at 13–14.

SMUD's site consolidation effort, and water and septic upgrades are attributable to the presence of SNF at Rancho Seco. Pl. Post Tr. Br. at 18. And, these efforts reduced SMUD's operation costs from 2010 to 2015. Pl. Post Tr. Br. at 18. In addition, SMUD should recover the cost of planning to replace the ISFSI backup generator, because SMUD was required to have a backup generator for the ISFSI. Pl. Post Tr. Br. at 14 (citing DX 73 at ¶ 27 (Brewer)).

**b. The Government's Response.**

The Government challenges the $698,255 claimed by SMUD for site consolidation, upgrades to the PAP building's water and septic systems, and planning to replace the ISFSI backup generator, as they were incurred to improve infrastructure that provides support to Rancho Seco's non-nuclear business. Gov't Post Tr. Resp. at 9–10. In addition, SMUD did not "prove the extent to which [its] incurred costs differ from the costs [it] would have incurred in the non-breach world." Gov't Post Tr. Br. at 11 (citing *Energy Nw.*, 641 F.3d at 1306).

**c. SMUD's Reply.**

SMUD replies that the purpose of the site consolidation project was to "to move the staff overseeing the nuclear fuel from the large, aging T & R building to the smaller PAP building in order to save operations and maintenance expenses." Pl. Post Tr. Reply at 8 (citing TR at 68, 78–81 (Ronningen); PX 20 (Site Consolidation Presentation)). SMUD upgraded the PAP building's water and septic systems to reduce operating expenses. Pl. Post Tr. Reply at 8 (citing TR at 73–74 (Ronningen); *see also* PX 20.013–20.014). If DOE had removed the SNF from Rancho Seco by 2004, SMUD would not have needed to consolidate the T & R and PAP buildings, or upgraded the water and septic systems. ***751** Pl. Post Tr. Reply at 9 (citing TR at 81 (Ronningen)).

**d. The Court's Resolution.**

**[23]** Mr. Ronningen testified that he prepared SMUD's damages claim and that his objective throughout that process was "[t]o capture the costs associated with the presence of spent nuclear fuel at Rancho Seco." TR at 48 (Ronningen). In determining what costs to include in the claim, Mr. Ronningen "evaluat[ed] [ ] the work that was done ... and ma[de] a reasonable assumption and a conservative assumption about how much of [those] costs were directly related to the presence of spent nuclear fuel." TR at 51–52 (Ronningen). The Government argues that this testimony demonstrates that Mr. Ronningen did not consider whether costs related to site consolidation, upgrades to the PAP building's water and septic systems, and planning to replace the ISFSI backup generator would have been incurred in the non-breach world. Gov't Post Tr. Br. at 12.

During the trial, however, SMUD presented credible evidence of the non-breach world, demonstrating that SMUD would not have consolidated the T & R and PAP buildings, upgraded the water and septic system in the PAP building, or replaced the ISFSI's backup generator if DOE had performed on the Standard Contract. Mr. Ronningen testified that SMUD would not have "done the consolidation from the T & R building to the PAP building if the spent fuel was gone by 2004[.]" TR at 81 (Ronningen). He also testified that SMUD would not have needed a septic system or new drinking water system in Rancho Seco if DOE had removed the SNF. TR at 78 (Ronningen). Finally, Mr. Ronningen testified that SMUD would not have purchased the ISFSI backup generator if the SNF was offsite. TR at 100 (Ronningen). Moreover, the generator did not provide ancillary benefits to any other equipment at Rancho Seco, except for some WAPA instruments. TR at 99 (Ronningen). But, in the non-breach world, those instruments would be located in the switchyard and connected to a separate generator. TR at 163, 217 (Ronningen).

The Government's expert witness, Mr. Brewer, testified that "SMUD has not explained how the site modifications or consolidation efforts have been influenced by the presence of personnel remaining on the site for decommissioning or other functions not needed for the continued storage of spent nuclear fuel." DX 72 at ¶ 42 (Brewer). But, this testimony is inaccurate. At trial, SMUD presented evidence that, after consolidation, only nuclear staff and security personnel had offices in the PAP building. TR at 81 (Ronningen). And, the PAP building did not provide support to other Rancho Seco buildings. TR at TR at 119, 121 (Ronningen). In addition, Mr. Ronningen testified that the SMUD employees who worked on the BCC, switchyard and solar power plant

were not permanently stationed at Rancho Seco. TR at 119, 121 (Ronningen). Instead, they worked from SMUD headquarters and visited the site a few times per year to check on equipment. TR at 119, 121 (Ronningen). Finally, Mr. Ronningen knew that non-nuclear staff periodically visited Rancho Seco, but he nevertheless testified that the site consolidation project would not have occurred but-for the required presence of nuclear staff and security onsite. TR at 81, 164 (Ronningen). Combined, this evidence demonstrates that the presence of non-nuclear staff at Rancho Seco did not impact the site consolidation project.

Mr. Brewer also testified that SMUD failed to explain why its decision to consolidate the T & R and PAP buildings in 2010 was attributable to the continued presence of SNF at Rancho Seco, given that all of Rancho Seco's SNF had been in dry storage since 2002 and the activities needed to store the SNF had remained static for several years. DX 72 at ¶ 41 (Brewer). But, Mr. Ronningen testified that Rancho Seco's nuclear staff was greatly reduced when SMUD completed the decommissioning process in 2008. TR at 67 (Ronningen). In fact, by the end of 2010, SMUD's nuclear staff had been reduced from "about a dozen" to three. TR at 65 (Ronningen). It made little sense for three people to occupy an entire building, especially a thirty-year old one with five stories and an aging HVAC. TR at 66–67 (Ronningen). It is undisputed, however, that the continued presence of SNF at Rancho Seco required SMUD to maintain some nuclear staff onsite. ***752** TR at 243 (Brewer) ("Q. You agree that it's necessary to have people to manage the spent fuel, right? A. I do. Q. And it's necessary to have security personnel to guard the fuel, correct? A. It is. Q. SMUD needs staff like Mr. Ronningen to work with the NRC to ensure compliance, right? A. They need some level of staff to ensure compliance, that's correct."). It is also undisputed that the nuclear staff needs offices to work in. TR at 244 (Brewer) ("So, you do agree that SMUD needs a building for the security staff to work in, Mr. Brewer, right? A. Just—I do, just as any other people that are on the site need somewhere to do their work."). This testimony demonstrates that SMUD's decision to consolidate the T & R and PAP building in 2010 was attributable to the continued presence of SNF at Rancho Seco.

For these reasons, the court has determined that SMUD is entitled to $698,255 for cost incurred for Site Consolidation, upgrades to the PAP building's water and septic systems, and planning to replace the ISFSI backup generator.

### 3. Whether SMUD Is Entitled To Recover Costs Incurred To Replace The HVAC Unit And Install New Carpet In The PAP Building.

#### a. SMUD's Argument.

SMUD argues that it is entitled to recover $452,899, incurred to replace the PAP building's failing HVAC unit. Pl. Post Tr. Br. at 19. The PAP building houses nuclear personnel and a nuclear records vault, that must be maintained onsite due to the continued presence of SNF at Rancho Seco. Pl. Post Tr. Br. at 20. The vault and personnel housed in the PAP building require adequate heating, ventilation and air conditioning. Pl. Post Tr. Br. at 19–20. The PAP building's original HVAC unit was installed in the 1980s. Pl. Post Tr. Br. at 19 (citing TR at 104 (Ronningen)). In 2015, when SMUD decided to replace it, the old equipment was antiquated and failing. Pl. Post Tr. Br. at 19 (citing TR at 104–05 (Ronningen)).

SMUD also argues that it is entitled to recover $28,308 because "[i]t was eminently reasonable for SMUD to install carpet in the PAP building to prepare the PAP to serve as the staff office building." Pl. Post Tr. Br. at 20 (citing TR at 82–83 (Ronningen)).

#### b. The Government's Response.

The Government challenges SMUD's claimed costs for installation of the PAP building's new HVAC unit and carpets, because these costs were incurred to improve infrastructure that provides support to non-SNF workers. Gov't Post Tr. Resp. at 9–10. In addition, the Government argues that SMUD did not "prove the extent to which [its] incurred costs differ from the costs [it] would have incurred in the non-breach world." Gov't Post Tr. Br. at 11 (citing *Energy Nw.*, 641 F.3d at 1306)).

#### c. SMUD's Reply.

SMUD replies that "[t]he Government presents no facts or evidence to dispute the causal connection between [DOE's]

breach [of the Standard Contract] and the HVAC [and] carpet costs." Pl. Post Tr. Reply at 10. Mr. Ronningen testified that SMUD would not have moved the SNF staff to the PAP building, if DOE removed Rancho Seco's SNF by 2004. Pl. Post Tr. Reply at 10 (citing TR at 81 (Ronningen)). And, if the PAP building would not have been occupied in the non-breach world, then SMUD would not have needed to replace the HVAC unit and carpets in that building. Pl. Post Tr. Reply at 10. Therefore, the costs that SMUD incurred to replace the HVAC unit and carpets are due to DOE's breach of the Standard Contract and the Government's witnesses did not offer any evidence to rebut this conclusion. Pl. Post Tr. Reply at 10.

**d. The Court's Resolution.**

**[24]** Mr. Ronningen testified that the PAP building did not provide support to other Rancho Seco buildings. TR at 119, 121 (Ronningen). And, the nuclear staff and security were the only employees located in the PAP building. TR at 81 (Ronningen). The Government did not present any evidence to the contrary. Therefore, SMUD established that the PAP building's new HVAC unit and carpets do not benefit Rancho Seco's non-nuclear activities.

Mr. Ronningen also testified that, in the non-breach world, the PAP building would not have been occupied. TR at 81 (Ronningen). ***753** Therefore, SMUD would not have installed new carpets in the building. And, the failing HVAC system would not have been replaced. TR at 106 (Ronningen). The Government did not offer any specific evidence to rebut this testimony. Accordingly, SMUD has established that, in the non-breach world, it would not have incurred costs to replace the PAP building's HVAC unit and carpets.

For these reasons, the court has determined that SMUD is entitled to recover $481,207 for costs incurred to replace the HVAC unit and install new carpets in the PAP building.

**4. Whether SMUD Is Entitled To Recover Costs Incurred To Replace The ISFSI Backup Generator And Refurbish Parts Of Rancho Seco's Electrical Infrastructure.**

**a. SMUD's Argument.**

SMUD argues that it is entitled to recover $573,214 for costs incurred to replace the diesel generator that provides backup power to the ISFSI and associated modification to the aging electrical infrastructure that supports the ISFSI and the PAP building. Pl. Post Tr. Br. at 21. NRC regulations require SMUD to maintain a functioning backup generator for the ISFSI and the ISFSI's original backup generator reached the end of its useful life during the claim period. Pl. Post Tr. Br. at 21 (citing TR at 95–96, 99 (Ronningen)). Therefore, SMUD was required to purchase and install a new backup generator and associated switchgear to comply with NRC regulations. Pl. Post Tr. Br. at 21 (citing TR at 95–96, 99 (Ronningen)).

Replacing the backup generator and switchgear involved "substantial work to design and implement the integration of the new equipment into the existing electrical distribution system, install the new equipment, connect it to the distribution infrastructure, purchase project-related cabling and fencing, and establish a concrete pad on which to place the generator." Pl. Post Tr. Br. at 21. Additionally, as part of the replacement process, SMUD updated the aging electrical infrastructure that supplies power to the ISFSI and PAP building. Pl. Post Tr. Br. at 21. But, SMUD would not have replaced the backup generator or performed any of the related electrical work, if DOE had removed all SMUD's SNF by 2004. Pl. Post Tr. Br. at 21–22.

The Government does not dispute that SMUD is entitled to recover the purchase price of the backup generator and switchgear, but argues that the cost of installing that equipment should be excluded from SMUD's claim. Pl. Post Tr. Br. at 22. But, Mr. Brewer, their own expert, testified "that the costs of installing the generator and switchgear are attributable to the SNF remaining onsite." Pl. Post Tr. Br. at 22 (citing TR at 257 (Brewer)). The "installation costs" include: "mounting the generator, connecting it to the fuel source, labor costs, and securing the generator with a fence." Pl. Post Tr. Br. at 22 (citing TR at 257 (Brewer)).

Mr. Ronningen's testimony also demonstrates that SMUD replaced the ISFSI backup generator and performed improvements to the electrical infrastructure for the sole purpose of providing backup power to

Rancho Seco's nuclear function. Pl. Post Tr. Br. at 24. The Government argues that this claim includes "costs associated with site restoration," such as "the re-feed of lighting power to the Turbine building, Chlorine building, and Warehouse/shops building," is mistaken. Pl. Post Tr. Br. at 22–23 (citing DX 73 at ¶ 52 (Brewer)). SMUD, however, only worked on the electrical equipment in the turbine and chlorine buildings, because the existing electrical distribution system passed through those facilities and it was less costly to refurbish the old equipment than to create a brand new system that avoided the two buildings entirely. Pl. Post Tr. Br. at 23. Although the warehouse building "*may* have lights that are powered through the nuclear electrical distribution system," it would not be in use if Rancho Seco's SNF had been removed by 2004. Pl. Post Tr. Br. at 24 n.11. Finally, the backup generator and improvements to the electrical distribution systems do not support the BCC or switchyard building. Pl. Post Tr. Br. at 23 (citing TR at 97, 154, 162–63 (Ronningen)).

**b. The Government's Response.**

The Government challenges $449,717 of SMUD's claim for costs incurred replacing ***754** the backup generator and refurbishing parts of Rancho Seco's electrical infrastructure, because they were incurred to improve infrastructure that provides support to non-nuclear activities at Rancho Seco. Gov't Post Tr. Resp. at 9–10. In addition, SMUD did not "prove the extent to which [its] incurred costs differ from the costs [it] would have incurred in the non-breach world." Gov't Post Tr. Br. at 11 (citing *Energy Nw.*, 641 F.3d at 1306)).

**c. SMUD's Reply.**

SMUD replies that, in the non-breach world, it would not have purchased a new backup generator for the ISFSI. Pl. Post Tr. Reply at 11 (citing TR at 100 (Ronningen)). As Mr. Brewer conceded, the cost to purchase and install the generator is attributable to SNF remaining at Rancho Seco. Pl. Post Tr. Reply at 11 (citing TR at 256–57 (Brewer)). Similarly, "[t]he only reason why the electrical distribution system continues to exist at Rancho Seco is to support the nuclear infrastructure." Pl. Post Tr. Reply at 11 (citing TR at 162 (Ronningen)). Therefore, SMUD's improvements to the electrical system only benefitted Rancho Seco's SNF-related operations. Pl. Post Tr. Reply at 11 (citing TR at 97–99, 163 (Ronningen)).

**d. The Court's Resolution.**

**[25]** Mr. Ronningen testified that the backup generator does not provide any ancillary benefit to non-nuclear equipment, except certain WAPA instruments. TR at 99 (Ronningen). But, in the non-breach world, those instruments would be located at the switchyard, which has a separate backup generator. TR at 163, 217 (Ronningen). Moreover, SMUD's upgrades to the electrical system do not benefit Rancho Seco's non-nuclear functions. TR at 97, 98, 154, 162–63 (Ronningen). As rebuttal evidence, the Government produced Mr. Brewer's testimony that SMUD should not recover some of the costs incurred to upgrade the electrical system, because those upgrades help support power distribution to buildings that have a non-nuclear function. DX 73 at ¶ 52 (Brewer). Specifically, Mr. Brewer identified "the Turbine building, Chlorine building, and Warehouse/shops building." DX 73 at ¶ 52 (Brewer). Mr. Ronningen, however, explained that the Turbine and Chlorine buildings were not operational during the claim period. TR at 98 (Ronningen) ("Q. Were the turbine building and chlorine building—was that being used in any way during the claim period? A. No, there's no functions that occur in there[.]"). Regarding the warehouse, Mr. Ronningen testified that there *may* be some lighting in that building. TR at 154 (Ronningen) (emphasis added). But, most of the material stored there is SNF handling equipment. TR at 221 (Ronningen). Therefore, SMUD has established that installation of the backup generator and associated upgrades to portions the electrical infrastructure, were not performed for the benefit of Rancho Seco's non-nuclear functions.

Moreover, Mr. Ronningen testified that SMUD would not have purchased the backup generator or done any of the associated electrical work, if DOE had removed Rancho Seco's SNF by 2004. TR at 100 (Ronningen). The Government does not dispute this testimony. In fact, on cross-examination, Mr. Brewer admitted that the cost of purchasing a new backup generator and switchgear, and installing that equipment were attributable to the presence of SNF at Rancho Seco. TR at 256–57. Therefore, SMUD has established that, in the non-breach world, it would not: have purchased the ISFSI backup generator or switchgear; installed that equipment; or upgraded the

relevant portions of Rancho Seco's electrical distribution infrastructure.

For these reasons, the court has determined that SMUD is entitled to recover $573,214 for costs incurred to replace the ISFSI backup generator and renovate parts of the electrical distribution system that supports the ISFSI and the PAP building.

### 5. Whether SMUD Is Entitled To Recover Costs Incurred For Operating, Maintaining And Repairing The IOSB And For Refurbishing Fuel Handling Equipment Stored In The IOSB.

#### a. SMUD's Argument.

SMUD argues that it incurred $980,500 in costs for operating, maintaining and repairing the IOSB, and refurbishing the spent fuel handling equipment stored there. Pl. Post Tr. Br. at 9 (citing PX 50; TR at 57–60 (Ronningen)). ***755** The court awarded SMUD similar costs in Civil Action Docket No. 09–587C, and should do so again in this case. Pl. Post Tr. Br. at 9.

In 2002, SMUD used fuel handling equipment to transfer Rancho Seco's SNF from the wet-pool to the newly constructed ISFSI. Pl. Post Tr. Br. at 9. As a result, this equipment became radioactively contaminated and it had to be stored in a licensed facility, such as the IOSB. Pl. Post Tr. Br. at 9. During construction of a permanent storage building that was not completed before June 30, 2015, the IOSB housed the fuel handling equipment. Pl. Post Tr. Br. at 9.

At trial, Mr. Ronningen testified that SMUD would not have used the ISOB to store fuel handling equipment, if DOE had removed the SNF by 2004. Pl. Post Tr. Br. at 10 (citing TR at 60 (Ronningen)). And, Mr. Brewer agreed that the presence of fuel handling equipment at Rancho Seco and the work necessary to maintain that equipment, were attributable to the presence of SNF. Pl. Post Tr. Br. at 10 (citing TR at 254 (Brewer)).

In sum, as long as SNF is stored at Rancho Seco, it will be necessary for SMUD to store the fuel handling equipment onsite, because an emergency may require the removal of an SNF canister. Pl. Post Tr. Br. at 9 (citing *SMUD VIII*, 109 Fed.Cl. at 691). Additionally, SMUD is preparing to renew its ISFSI license, pursuant to 10 C.F.R. 72. [20] And, as part of the relicensing process, the NRC may require SMUD to extract SNF canisters from the ISFSI. Pl. Post Tr. Br. at 10.

20 10 C.F.R. 72, in relevant part, provides,

> requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel, power reactor-related Greater than Class C (GTCC) waste, and other radioactive materials associated with spent fuel storage in an independent spent fuel storage installation (ISFSI) and the terms and conditions under which the Commission will issue these licenses.

10 C.F.R. 72.1.

#### b. The Government's Response.

The Government responds that SMUD recovered IOSB costs in Civil Action Docket No. 09-587C, based on specific circumstances that do not apply in this case. Gov't Post Tr. Resp. at 18. In Docket No. 09-587C, SMUD argued that it refurbished the IOSB to store Class B and C waste. [21] Gov't Post Tr. Resp. at 18 (citing *SMUD VIII*, 109 Fed.Cl. at 690). The court, however, determined that all Rancho Seco's nuclear waste, including Class B and C waste, would have been removed by 2009, if DOE had performed on the Standard Contract. Gov't Post Tr. Resp. at 18 (citing *SMUD VIII*, 109 Fed.Cl. at 691). Therefore, "in the non-breach world, SMUD would not have refurbished the IOSB nor incurred operation and maintenance costs for the IOSB." Gov't Post Tr. Resp. at 18 (citing *SMUD VIII*, 109 Fed.Cl. at 691). In addition, the court determined that, in the non-breach world, SMUD would not be required to maintain transfer equipment at Rancho Seco, because SMUD's SNF and HLW would have been removed by 2004. Gov't Post Tr. Resp. at 18 (citing *SMUD VIII*, 109 Fed.Cl. at 691).

21 The NRC categorized low-level waste as Class A, B or C, according to the radiological hazard of the waste. *See* 10 C.F.R. 61.55(a)(1). Class A is the least hazardous, and Class C is the most. *See* 10 C.F.R. 61.55(a)(2). As the Class increases, NRC regulations impose greater controls to protect the health and safety of the public and the environment. *Id.*

In this case, however, Mr. Ronningen testified that SMUD removed all Class B and C waste from Rancho

Seco in 2014. Gov't Post Tr. Resp. at 19–20 (citing TR at 185 (Ronningen)). In addition, Mr. Ronningen also testified that SMUD intended to decommission and dismantle the IOSB despite the continued presence of SNF at Rancho Seco. Gov't Post Tr. Resp. at 20 (citing TR at 186 (Ronningen)). Moreover, during the current claim period, some of the SNF handling equipment, including the transfer cask and the hydraulic ram, was not stored in the IOSB. Gov't Post Tr. Resp. at 20 (citing TR at 190 (Ronningen)). Mr. Ronningen testified that SMUD installed a new building on the ISFSI to store some of the handling equipment. Gov't Post Tr. Resp. at 20 (citing TR at 189 (Ronningen)). For these reasons, SMUD has failed to demonstrate that the planning, operation, and maintenance of the IOSB were necessitated by the presence of SNF at Rancho ***756** Seco or that the same circumstances justifying recovery of IOSB costs in Docket No. 09–587C exist in this case. Gov't Post Tr. Resp. at 20.

**c. SMUD's Reply.**

SMUD replies that the removal of Rancho Seco's Class B and C waste is irrelevant to whether SMUD can recover ISOB costs. Pl. Post Tr. Reply at 12. In *SMUD VIII*, the court awarded IOSB costs, because it determined that the building was necessary to store contaminated handling equipment that would not be onsite, if DOE performed the Standard Contract. Pl. Post Tr. Reply at 12 (citing *SMUD VIII*, 109 Fed.Cl. at 684, 691). The court's determination was not based on the presence of Class B and C waste at Rancho Seco. P. Post Tr. Reply at 12.

In addition, the Government's argument that SMUD stored uncontaminated handling equipment outside of the IOSB is irrelevant, because the IOSB is necessary to store contaminated handling equipment, and Mr. Ronningen testified that all of SMUD's contaminated equipment was stored there until 2015. Pl. Post Tr. Reply at 13 (citing TR at 210–11 (Ronningen)).

SMUD adds that its decision to move handling equipment from the IOSB to a new ISFSI building in 2015, is not relevant to SMUD's claim for IOSB costs incurred before the move. Pl. Post Tr. Reply at 13. The installation of a new ISFSI building does not establish that SMUD's prior use of the IOSB was inappropriate or unnecessary. Pl. Post Tr. Reply at 13.

**d. The Court's Resolution.**

**[26]** The Government argues that DOE's partial breach of the Standard Contract did not require SMUD to maintain the IOSB, because Rancho Seco's Class B and C waste was removed by 2014, some of the handling equipment was not stored in the IOSB during the entire claim period, and SMUD transferred the handling equipment to a permanent building within the ISFSI in 2015. Gov't Post Tr. Br. at 19–20. It is unclear whether the Government is arguing that: (1) SMUD's continued use of the IOSB was not caused by the DOE's partial breach; or (2) it was unreasonable for SMUD to continue using the IOSB under the circumstances. Either way, the Government's argument is not persuasive.

Regarding causation, the DOE's partial breach of the Standard Contract was a substantial factor in, if not the but-for cause of, SMUD's use of the IOSB from 2010 to 2015. During that time period, the IOSB was used to store Class B and C waste, and contaminated fuel handling equipment. TR at 57, 185. Mr. Ronningen, however, testified that SMUD would not have used the IOSB from 2010 to 2015 if DOE had performed under the Standard Contract. TR at 60 (Ronningen). The Government did not refute this testimony. In fact, Mr. Brewer agreed that SMUD would not have used the IOSB to store handling equipment, "because there would have been none." TR at 254 (Brewer). And, refused to provide any opinion on whether the IOSB would have been used to store Class B and C waste. TR at 254 (Brewer) ("Q. [Y]ou are not offering an opinion in this case that the B and C waste would have been onsite [after] 2009, is that correct? A. No, I'm not."). In light of the Government's failure to refute Mr. Ronningen's testimony, the court has found that SMUD would not have operated the IOSB during the claim period if DOE removed Rancho Seco's SNF by 2004. In other words, DOE's breach is the but-for cause of SMUD's continued use of the IOSB.

**[27]** **[28]** Regarding reasonableness, a party that is mitigating damages from a breach is only required to "make those efforts that are fair and reasonable under the circumstances." *Home Savings of Am. v. United States*, 399 F.3d 1341, 1353 (Fed.Cir.2005) (quoting *Robinson v. United States*, 305 F.3d 1330, 1333 (Fed.Cir.2002)). The breaching party bears the burden of establishing that a certain mitigation effort was unreasonable. *See*

*SMUD V*, 293 Fed.Appx. at 772 ("It is the Government's burden to show that it was unreasonable for SMUD to pursue [certain efforts] to mitigate the Government's breach); *see also Tennessee Valley Auth. v. United States*, 69 Fed.Cl. 515, 523 (2006) ("[T]he government bears the burden of showing that [plaintiff's] mitigation efforts were unreasonable.").

***757** In this case, the Government has not satisfied its burden of establishing that it was unreasonable for SMUD to store Class B and C waste, and fuel handling equipment in the IOSB. The Government's argument that it was not reasonable for SMUD to use the IOSB after it removed the Class B and C waste from that building in 2014, is irrelevant for most of the claim period, covering January 1, 2010 to June 30, 2015. Moreover, SMUD was required to store contaminated handling equipment in a licensed facility, such as the IOSB. TR at 59–60, 211 (Ronningen). And, the equipment had to remain onsite, because an emergency might require the removal of an SNF canister from the ISFSI. *See SMUD VIII*, 109 Fed.Cl. at 691. Moreover, SMUD must relicense the ISFSI in the near future and, as part of that process, the handling equipment will be required onsite to move SNF canisters. TR at 93 (Ronningen). Therefore, SMUD had the choice between constructing a permanent facility to store the contaminated equipment at Rancho Seco and storing it in the preexisting IOSB. SMUD decided to store the equipment in the IOSB from 2010 to 2015. TR at 189. The Government does not explain how the reasonableness of this decision depends on the presence of Class B and C waste in the IOSB.

In addition, SMUD's decision to store uncontaminated equipment outside of the IOSB is irrelevant. Mr. Ronningen testified that the IOSB was necessary to house contaminated handling equipment, such as the failed fuel grapple and the lifting yoke. TR at 211 (Ronningen). And, all contaminated equipment was stored inside the IOSB during the claim period, except temporarily when SMUD moved the equipment out of the way, so it could dispose of the Class B and C waste that was also stored there. TR at 58–59 (Ronningen). Finally, the Government does not explain why SMUD's transfer of the handling equipment to a new ISFSI building after the claim period is relevant to the reasonableness of SMUD's use of the IOSB during that period.

For these reasons, the court has determined that SMUD is entitled to recover $980,500 for costs incurred to operate, maintain and repair the IOSB, and refurbish the spent fuel handling equipment stored in the IOSB.

### 6. Whether SMUD Is Entitled To Recover Brokerage Fees Incurred To Obtain ANI Insurance.

#### a. SMUD's Argument.

SMUD incurred insurance brokerage fees of $86,010 to obtain the nuclear insurance required by NRC regulations. Pl. Post Tr. Br. at 24. These fees are the direct consequence of DOE's partial breach of the June 14, 1983 Standard Contract and are just as recoverable as the cost of insurance, that the court awarded in *SMUD VIII* and *SMUD X*. Pl. Post Tr. Br. at 24.

SMUD argues that it established entitlement to claimed brokerage fees with reasonable certainty. Pl. Post Tr. Br. at 25. At trial, SMUD presented the testimony of its insurance broker, *i.e.*, "the person with the most credible knowledge about the brokerage fees." Pl. Post Tr. Br. at 25. In addition, SMUD produced "numerous documents supporting its brokerage fees" and the "testimony of [Mr. Kenneth P. Metcalfe][22] evaluating and affirming the claimed costs." Pl. Post Tr. Br. at 25.

22 Mr. Kenneth P. Metcalfe is the Co-Chief Executive Officer of the Kenrich Group in Washington D.C. TR at 329. The Kenrich Group provides business consulting services, as well as the analysis and preparation of damages claims. TR at 330. Mr. Metcalfe's expertise falls into three main categories: (1) regulated industries and regulatory accounting; (2) government contracts; and (3) economic damages in breach of contract disputes. TR at 330. Over his thirty-four year career, Mr. Metcalfe has served as an expert witnesses in over two dozen nuclear fuel cases. TR at 333. In 1982, he graduated *cum laude* from Georgetown University School of Business with a major in accounting. TR at 331. In addition, Mr. Metcalfe is a Certified Public Accountant in Virginia, a Certified Valuation Analyst and an Associate Certified Fraud Examiner. TR at 331. SMUD proffered Mr. Metcalfe as an expert in cost and regulatory accounting in the utility industry. TR at 337. The Government did not object to Mr. Metcalfe's qualifications. Accordingly, the court has

> determined that Mr. Metcalfe is an expert in his respective field and qualified to testify as such. *See* Fed. R. Evid. 702.

Mr. Derek Whipple is a Managing Director at Aon Risk Insurance Services West, Inc. ***758** ("Aon"). Pl. Post Tr. Br. at 25. He is "responsible for the brokerage services Aon provides SMUD on all its policies, including its nuclear insurance." Pl. Post Tr. Br. at 25 (citing PX 8 at 42 (Deposition Testimony of Mr. Derek Whipple)). Mr. Whipple testified that, during the claim period, Aon charged SMUD a flat annual brokerage fee for its services. Pl. Post Tr. Br. at 25 (citing PX 8 at 65 (Whipple Deposition)). Aon determined SMUD's annual fees in two contracts. The first established SMUD's fees from 2009 to 2014, and the second established fees from 2014 to 2018. Pl. Post Tr. Br. at 25 (citing PX 8 at 38, 65–66 (Whipple Deposition)). Mr. Whipple testified that "[i]f SMUD no longer needed to purchase nuclear liability insurance, Aon would decrease its annual brokerage fees to SMUD." Pl. Post Tr. Br. at 26 (citing PX 8 at 72–74 (Whipple Deposition)). A conservative estimate of this decrease could be calculated by reducing SMUD's current fees by the percentage of SMUD's ANI premiums to total insurance premiums. Pl. Post Tr. Br. at 26 (citing PX 8 at 76, 81–84 (Whipple Deposition)).

In support of its claimed brokerage fees, calculated using Mr. Whipple's conservative methodology, SMUD produced both Aon contracts with supporting documents showing SMUD's ANI premiums and total premiums and information about the insurance programs that Aon brokered for SMUD. Pl. Post Tr. Br. at 27 (citing PX 1; PX 2; PX 3; PX 4; PX 5; PX 6; PX 12; PX 13; PX 14; PX 15; PX 16; PX 17; PX 18; PX 19; PX 44; PX 45; PX 46). In addition, Mr. Whipple's testimony and the supporting documents produced by SMUD, establish SMUD's claimed brokerage fees with reasonable certainty. Pl. Post Tr. Br. at 28.

**b. The Government's Response.**

The Government responds that SMUD did not prove the claimed brokerage fees with reasonable certainty, because SMUD relied on a flawed estimate prepared by Mr. Whipple and Mr. Metcalfe. Gov't Post Tr. Resp. at 24. Mr. Whipple's testimony is not reliable, because "he lacks personal knowledge about the calculation of fees, and he did not [ ] consider all of the factors that influence the price of brokerage services." Gov't Post Tr. Resp. at 24. Similarly, Mr. Metcalfe's testimony is unreliable, because he relied on Mr. Whipple's flawed methodology. Gov't Post Tr. Resp. at 24.

Mr. Whipple has no factual basis for assuming that Aon would decrease SMUD's annual brokerage fees, if SMUD no longer needed to purchase nuclear liability insurance. Gov't Post Tr. Resp. at 25. SMUD's brokerage fees for the relevant claim period are established by a contract executed in 2009 and another contract executed in 2014. Gov't Post Tr. Resp. at 25. Mr. Whipple, however, began working for Aon in 2015. Gov't Post Tr. Resp. at 25. Moreover, "[d]espite the multitude of parameters Aon used to determine [SMUD's] brokerage fees, Mr. Whipple only used one[,] level of premiums[,] when he estimated the portion of brokerage fees attributable to the ANI nuclear liability insurance." Gov't Post Tr. Resp. at 26.

**c. SMUD's Reply.**

SMUD replies that "[t]he Government misunderstands SMUD's burden and confuses the breach and non-breach worlds." Pl. Post Tr. Reply at 14. "[W]hen damages are hard to estimate, the burden of imprecision does not fall on the innocent party. If a reasonable probability of damage can be clearly established, uncertainty as to the amount will not preclude recovery." Pl. Post Tr. Reply at 14 (quoting *LaSalle Talman Bank*, 317 F.3d at 1374).

In the non-breach world, SMUD would have exited the nuclear industry by 2009. Pl. Post Tr. Reply at 14 (citing *SMUD VIII*, 109 Fed.Cl. at 694). Accordingly, SMUD would not have purchased the nuclear insurance policies brokered by Aon. Pl. Post Tr. Reply at 14. Therefore, SMUD is entitled to recover the costs of the brokerage fees. Pl. Post Tr. Reply at 14. Any imprecision in the calculation of these fees falls on the Government, as the breaching party. Pl. Post Tr. Reply at 14.

The fact that Mr. Whipple, who serves as SMUD's insurance broker, was not an Aon employee at the time that SMUD and Aon signed the brokerage fee contracts is not material to whether he has knowledge of the brokerage activities or fees incurred. Pl. Post ***759** Tr. Reply at 15. Mr. Whipple is a Senior Executive at Aon with over a decade of experience in the insurance brokerage industry. Pl. Post Tr. Reply at 15. His experience and understanding

of brokerage fee negotiations, as well as his familiarity with SMUD and its insurance requirements, provide him with sufficient knowledge to credibly testify that SMUD's annual brokerage fees would be lower in the non-breach world. Pl. Post Tr. Reply at 15.

The fact that, Mr. Whipple did not address all factors relevant to brokerage fee negotiations does not undermine his testimony. Pl. Post Tr. Reply at 16. Mr. Whipple admitted that there are multiple ways to estimate SMUD's brokerage fees, but those methods yield higher estimates. Pl. Post Tr. Reply at 16. Moreover, Mr. Whipple's methodology is commonly used to calculate brokerage fees. Pl. Post Tr. Reply at 16.

**d. The Court's Resolution.**

**[29]** "The ascertainment of damages is not an exact science, and where responsibility for damage is clear, it is not essential that the amount thereof be ascertainable with absolute exactness or mathematical precision: 'It is enough if the evidence adduced is sufficient to enable a court or jury to make a fair and reasonable approximation.' " *Bluebonnet Sav. Bank, F.S.B. v. United States*, 266 F.3d 1348, 1355 (Fed. Cir. 2001) (quoting *Elec. & Missile Facilities, Inc. v. United States*, 416 F.2d 1345, 1358 (Ct. Cl. 1969)); *see also Locke v. United States*, 283 F.2d 521, 524 (Ct. Cl. 1960) ("Certainty is sufficient if the evidence adduced enables the court to make a fair and reasonable approximation of the damages.").

**[30]** In this case, SMUD produced sufficient evidence for the court to make a fair and reasonable approximation of the brokerage fees it incurred to purchase ANI insurance. As the Aon director responsible for all of SMUD's brokerage fees, Mr. Whipple was in a position to testify regarding what portion of SMUD's brokerage fees are attributable to ANI insurance. The fact that Mr. Whipple was not employed by Aon during the negotiation of SMUD's brokerage fees for the relevant time period does not undermine his credibility. It is reasonable to assume that the managing director in charge of SMUD's brokerage fees would familiarize himself with the factors that affect their pricing.

In addition, Mr. Whipple's methodology provides the basis for a "fair and reasonable *approximation*" of SMUD's ANI brokerage fees. *See Bluebonnet*, 266 F.3d at 1355 (emphasis added). Mr. Whipple testified that his methodology provided a conservative estimate of SMUD's brokerage fees, because "[i]f SMUD were to obtain brokerage services on the open market, it could expect to pay a commission equal to a fixed percentage of the premium amounts." PX 9 at ¶ 7 (Whipple Declaration). A typical commission ranges from 10% to 15%. PX 9 at ¶ 7 (Whipple Declaration). But, even assuming a 10% rate, SMUD's ANI brokerage fee would be much higher than Mr. Whipple's estimate. PX 9 at ¶ 7 (Whipple Declaration). The Government does not dispute Mr. Whipple's methodology, except to argue that he did not consider all of the factors that could have affected the pricing of SMUD's brokerage fees. But, "certainty" does not require SMUD to consider all of the relevant factors. Indeed, it is not "essential that the [amount of damages] be ascertainable with absolute exactness or mathematical precision. *See Bluebonnet*, 266 F.3d at 1355. SMUD is only required to provide the basis for a "fair and reasonable *approximation*." *Id.* (emphasis added).

For these reasons, the court has determined that SMUD satisfied this standard. Accordingly, SMUD is entitled to recover $86,010 for brokerage fees incurred to purchase ANI insurance.

**7. Whether The Government Is Entitled To An Offset For Certain ANI Insurance Refunds That SMUD Received.**

**a. SMUD's Argument.**

SMUD also claims ANI insurance premiums from 2010 to 2015, because the Government is not entitled to a $682,397 offset for refunds that SMUD received between 2010 and 2014, for premiums that SMUD paid before 2004. Pl. Post Tr. Br. at 30. An offset based on these insurance refunds would require the court to combine damages from this claim period with damages from an earlier ***760** claim period. *See* Civil Action Docket No. 98-488C (claiming breach of contract damages for costs that SMUD incurred from 1992 to 2004). But, the United States Court of Appeals for the Federal Circuit has held that combining damages from two separate claim periods violates "the settled principle that a breaching party should never be placed in a better position as a result of its breach." Pl. Post Tr. Br. at 30 (quoting *SMUD IX*, 566 Fed.Appx. at 996).

**b. The Government's Response.**

The Government responds that SMUD's ANI insurance claim should be offset by the full amount of ANI refunds, received from 2010 to 2015, because these refunds lessen the financial impact of paying premiums for those years. Gov't Post Tr. Resp. at 20. Moreover, the "premiums SMUD pays each year are not ... segregated for a particular year." Gov't Post Tr. Resp. at 21. Instead, the premiums go into a general fund that is used to pay claims, expenses and refunds. Gov't Post Tr. Resp. at 21. Refunds are calculated yearly. Gov't Post Tr. Resp. at 22.

In addition, the United States Court of Appeals for the Federal Circuit has held that plaintiffs' claims should reflect consideration of each claim period on its own. Gov't Post Tr. Resp. at 23 (citing *Ind. Mich.*, 422 F.3d at 1376–78; *Yankee Atomic*, 536 F.3d at 1282). Therefore, all payments and refunds recorded from January 1, 2010 to June 30, 2015, should be included in the court's award of damages for that period. Gov't Post Tr. Resp. at 23. SMUD's accounting system recorded ANI refunds as credits for the year that they were received. Gov't Post Tr. Resp. at 23. But, SMUD's damages claim does not reflect the full amount of those refunds. Gov't Post Tr. Resp. at 23. Accordingly, "SMUD overstated the cost it incurred between January 2010 and June 2015 for ANI nuclear liability insurance ... and [ ] should not be permitted to recover those costs." Gov't Post Tr. Resp. at 23.

**c. SMUD's Reply.**

SMUD replies that ANI refunds "reduce the net cost of insurance in the year the premium was paid, not the year the refund was paid." Pl. Post Tr. Reply at 17–18 (citing PX 33 at 111–12). In fact, ANI distributes refunds on a pro rata basis only to those entities that paid a reserve premium ten years before distribution. Pl. Post Tr. Reply at 18 (citing PX 33 at 112, PC 32.002). Therefore, the refunds paid to SMUD from 2009 to 2014 correspond to costs incurred between 2000 and 2004. Pl. Post Tr. Reply at 17. But, SMUD's damages for the 1992–2004 claim period have already been litigated in Civil Action Docket No. 98–488C. Accordingly, the court cannot award an offset that corresponds to that claim period. Pl. Post Tr. Reply at 19.

**d. The Court's Resolution.**

**[31]** In cases arising out of DOE's partial breach of the Standard Contract, plaintiffs must litigate damages in successive suits. *See Indiana Michigan Power Co. v. United States*, 422 F.3d 1369, 1376–78 (Fed. Cir. 2005). This litigation structure limits plaintiffs' ability to collect future damages. *Id.* In *SMUD IX*, the United States Court of Appeals for the Federal Circuit held that "this precedent also limits [the Government's] ability to obtain future offsets." *SMUD IX*, 566 Fed.Appx. at 996 (citing *Indiana Michigan Power*, 422 F.3d at 1377)). Our appellate court also ruled that an order staying judgment in one damages period, pending an offset determination related to a later damages period, constituted a constructive award of future offsets. *Id.*

**[32]** SMUD argues that the Government's claimed offset is prohibited by *SMUD IX*, because "it seeks to take costs from one period ... and use them against SMUD in the later period." Pl. Post Tr. Br. at 30. But, the appellate court's holding in *SMUD IX* is based on the principle that the Government cannot recover *future offsets*. *See SMUD IX*, 566 Fed.Appx. at 996 (emphasis added). In this case, the Government is seeking an offset that was realized in the current damages period, although it related to damages incurred prior to this period.

For these reasons, the court has determined that the Government is entitled to a $682,397 offset for ANI insurance refunds that SMUD received between 2010 and 2015.

***761 III. CONCLUSION.**

For these reasons, the court has determined that SMUD is entitled to $28,867,161 in damages to mitigate the Government's partial breach of the Standard Contract from January 1, 2010 to June 30, 2015. Accordingly, SMUD's July 29, 2016 Motion For Partial Summary Judgment, pursuant to RCFC 56(a), is moot. The Clerk of the United States Court of Federal Claims is directed to enter final judgment in accordance with this Memorandum Opinion and Final Order.

**IT IS SO ORDERED.**

93F ed. Cl. 7C, 32ER1 401 9F98

**All Citations**

Nuclear Reg. Rep. P 20,780, 130 Fed.Cl. 735, 84 ERC 1016

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# APPENDIX D

# D&D Organization
# Resumes

# TERRY KRAUSE

## Nuclear Quality Manager

Mr. Krause is serving Burns & McDonnell as the Quality Manager in the Energy division. He has over 28 years of experience related to electric generating stations, with most of those years in the areas of quality assurance, quality control and supplier quality. A brief summary of his experience is provided below.

### EDUCATION

- BS, Technology Management
- AAS, Engineering Technology

### REGISTRATIONS

- Quality Assurance Lead Auditor, ASME NQA-1, ANSI N45.2.23

**6** YEARS WITH BURNS & MCDONNELL

**28** YEARS OF EXPERIENCE

### Burns & McDonnell

Kansas City, Missouri | January 2009 – Present

Mr. Krause has the overall responsibly for the successful implementation of the Burns & McDonnell Quality Assurance Program for the Energy division. This includes the oversight of client projects and quality reviews during project execution.

### Wolf Creek Nuclear Operating Corporation

Burlington, Kansas | July 1986 – January 2009

***Manager Quality***

- Managing the activities of the Quality Assurance, Quality Control and Procurement Quality organizations.
- Responsible for the oversight and assessment of plant activities to ensure the implementation and effectiveness of the WCNOC Quality Assurance Program, improved plant performance and compliance with plant operating license requirements.
- Responsible for the implementation of a quality verification program to ensure the effective programs for quality standards and compliance are in place at domestic/international suppliers who provide materials, equipment or services affecting safety and reliability of the station.
- Responsible for the inspection of products and processes affecting plant safety and reliability.
- Monitoring quality oversight reviews of activities affecting safety and reliability with full authority to initiate, modify or suspend (stop work) activities.
- Initiating and participating in quality issues discussions with the WCNOC staff, management and/or outside organizations (Nuclear Regulatory Commission, Owners, Institute of Nuclear Power Operations, etc.).
- WCNOC Nuclear Quality Management Leadership (NQML) Representative.

***Manager Quality and Performance Improvement***

- Managing the activities of the Quality Assurance, Quality Control, Procurement Quality and Performance Improvement organizations.
- Overall responsibility for the implementation of the stations human performance, self-assessment, industry operating experience, and performance improvement activities.
- Coordination of benchmarking activities to determine industry best practices. Responsible for the schedule, implementation and monitoring of performance improvement initiatives. Provide guidance related to the performance improvement functions of human performance, operating experience, and self-assessment supporting a culture of continuous improvement.

***Supervisor Quality Assurance***

- Responsible for the independent quality oversight and assessment of plant activities. Ensure results are effectively communicated to plant management and functional area work groups.
- Manage a list of 160 qualified domestic/international material and service suppliers. Coordinate scheduling, planning, performing and reporting of supplier audits, surveillances, surveys and evaluations.
- Ensure proper certification of Quality Assurance audit personnel.
- WCNOC Nuclear Procurement Issues Committee (NUPIC) Representative.

***Supervisor Supplier/Materials Quality***

- Responsible for the maintenance of 160 qualified domestic/international suppliers of material and services.
- Accountable for inspection planning and receiving inspection including material verification testing.
- Ensured proper certification of a Supplier/Materials Quality audit and inspection personnel.
- WCNOC Nuclear Procurement Issues Committee (NUPIC) Representative.

***Supplier Quality Specialist***

- Led and participated on audits/surveys of domestic/international suppliers to verify compliance to applicable codes, quality standards, and specifications. Conducted surveillances of suppliers to verify corrective actions, witnessed supplier tests/inspections and verified product critical characteristics.
- Evaluated incoming correspondence related to WCNOC's 200 approved suppliers to determine impact on qualification status.
- Prepared annual audit and survey schedule of approved suppliers.
- Interfaced with Nuclear Regulatory Commission officials, suppliers, and WCNOC plant personnel regarding quality issues.

## Nuclear Industry Involvement

- Participated in an industry task group to evaluate the ISO 9000 quality standard for use in the procurement of materials for nuclear power plants. As a result, several Technical Reports were published through the Electric Power Research Institute.

  TR-1003104, *Assessment of the ISO 9000 Quality Management System Registrar Accreditation and Supplier Certification Processes*

  TR-1003105, *Dedicating Commercial-Grade Items Procured From ISO 9000 Suppliers*

  TR-1007937, *Analysis and Comparison ANSI/ISO/ASQ Q9001:2000 with 10CFR50, Appendix B, ISO 9000 Gap Analysis*

  TR-1008258, *An Overview of Other Industry Experience with ISO 9000 Quality Management System*

  TR-1002976, *An In-Depth Review of Licensee Procurement Options for Use With ISO 9000 Suppliers*

- Member of the Nuclear Quality Management Leadership standards working group that developed the nuclear industry recognized *Performance Objectives and Attributes* (NQML 07-001) and *Nuclear Industry Evaluation Program Guidelines* (NQML 07-002) for quality organization and program excellence.

**JOHN D. RYAN, CHST**
**REGIONAL**
**HEALTH AND SAFETY MANAGER**

## *PROFESSIONAL EXPERIENCE*

As Regional Manager of Health and Safety, Mr. Ryan is responsible for the safety and compliance of all NorthStar projects up and down the eastern seaboard from Maine to Florida. Mr. Ryan's responsibilities include providing technical assistance in the area of safety and health to all management and operations personnel. Through the performance of job site audits he has assisted in the reduction of accidents and regulatory violations and citations by ensuring full compliance with our Corporate Safety Program, TARGET ZERO, and all applicable rules and regulations governing our industry. As the Regional Manager, he develops and implements specific safety-training programs for projects in his territory. He is also NorthStar's representative for meetings and hearings with regulatory agencies.

Mr. Ryan has over 30 years in the construction industry with over 16 years of experience as a safety and compliance officer. He has been certified to conduct training in HAZWOPER and the OSHA Outreach Program. He also holds current certification as an Asbestos Project Designer and has been instructing supervisor safety training seminars since 1995 for various organizations. Additionally, he has served as a guest speaker for contractor's site supervisors and safety representatives.

## *CERTIFICATIONS*

Construction Health and Safety Technician (CHST) #C3198
Asbestos Project Monitor
Asbestos Inspector
Asbestos Management Planner
Asbestos Designer
NIOSH 582
Scaffold Train the Trainer / Designer # 27567
Fall Protection Equipment Inspector #20050315
Rigging & Signaling Train-The-Trainer # 12-6797
Aerial Work Platform Trainer
40 Hour HAZWOPER/Supervisor
OSHA 502 Construction Outreach Train the Trainer # C0069279
OSHA 5600 Disaster Site Worker Train the Trainer # TR0011665
Massachusetts Lead Inspector Training
NACE Coating Technician
SSPC C-3 Supervisor for De-leading of Industrial Structures
Commonwealth of Massachusetts Construction Supervisor License
Niton XRF Spectrum Analyzer Certification (Lead)
USEPA Lead Safe Renovations
FEMA Incident Command System ICS 100
First Aid / BLS CPR Certified
Radiation Safety Officer
Radiation Worker

NorthStar

TARGET ZERO
COMMITTED TO SAFETY

***PROJECT EXPERIENCE***

Central Artery and Tunnel Project, Boston, MA
Asbestos and Lead Abatement / Deconstruction

World Trade Center Site, New York, NY
Emergency Decontamination September 11, 2001

Pentagon, Washington, DC
Asbestos and Lead Abatement / Deconstruction

NASA, Florida Operations
Lead and Chemical clean up

New Orleans, LA (Katrina)
Emergency Decontamination

130 Liberty Street, NY, New York
Decontamination and Deconstruction of a 27 Story Office Building

Yankee Stadium, NY, New York
Asbestos and Lead Abatement / Deconstruction

Madison Square Garden, NY, New York
Asbestos and Lead Abatement / Deconstruction

St. Vincent's Hospital Project
New York, NY
Asbestos Abatement and Demolition of Multiple Buildings

Poletti Power Plant
Astoria, NY
Asbestos Abatement and Structural Demolition

PEPCO Benning Road Power Station
Washington, DC
Asbestos Abatement and Structural Demolition

RG&E Beebee Station
Rochester, NY
Asbestos and PCB Abatement and Structural Demolition

RG&E Russell Station
Greece, NY
Asbestos & PCB Abatement and Structural Demolition

Hoffmann-La Roche Inc.
Nutley, NJ
Excavation and Removal of Contaminated soil

FPL Turkey Point Plant
Homestead, FL
Asbestos & PCB Abatement and Structural Demolition

FPL Port Everglades Facility
Fort Lauderdale, FL
Asbestos & PCB Abatement and Structural Demolition

## COREY R. DANIELS

### Professional Summary

*Nuclear operations and maintenance professional with 24 years experience. Dedicated team player who demonstrates exceptional ownership, work ethic, integrity and accountability. Possesses strong leadership skills based on excellent communication, conflict management, and mentoring ability. Understands and employs successful management discipline principles for achieving safe, reliable, and cost effective plant maintenance and operation. Well rounded back ground with both BWR and PWR O&M experience as well as non-nuclear plant construction, and O&M. Strong troubleshooting experience and effective risk assessment and mitigation for integrated plant operations. Contract Manger and labor relations veteran with experience resolving workforce issues, providing oversight, and successfully negotiating multiple bargaining agreements.*

## PROFESSIONAL EXPERIENCE

***Plant Manager Decommissioning*** **Vermont Yankee** Nov 2015 – Present
Director of all Station activities on site. Direct reports include Senior Manager of Operations, Production, RP and Chemistry Manger, E-plan Manager, and Security Manger. Collaboratively develop and implement preparation for placing all spent fuel in dry cask storage and transition of facility to SAFSTOR condition as the assigned Senior Manager of Production. Selected and prepared staff for transition to second phase of decommissioning. Responsible for station maintenance, operation, system abandonment and continued reduction of station work scope commensurate SAFSTOR Phase 2 needs and requirements. Maintains the station within Technical Specifications, Code of Federal Regulations, and applicable NRC Inspection Procedure guidelines. Promotes core values to maintain station in the safest, most conservative, effective, and competent manner possible while transitioning to all spent nuclear fuel placed in dry storage and remainder of the facility in full dormancy.

***Mechanical Maintenance Superintendent*** **Vermont Yankee** Jan 2015 – Nov 2015
Oversee both mechanical maintenance and facilities departments performing all scheduled work as well providing abandonment efforts, engineering change project support and sustaining site logistics. Sets and develops work schedule for PMs and Surveillances, prioritizes corrective maintenance and emergent work while effectively assessing and mitigating risk. Promotes core values to maintain station in the safest, most conservative, effective, and competent manner possible.

***FIN Superintendent*** **Vermont Yankee** Oct 2009 – Jan 2015
Director of multi-discipline maintenance department responsible for troubleshooting, planning, and executing emergent work. Sets priorities and resolves operational issues with on-shift operating crew while effectively assessing and mitigates risk. Protect the scheduled work process by addressing backlog challenges and solving operational and integrated system equipment challenges.

***Maintenance Manger Vermont Yankee*** Jan 2013 to Oct 2013
Filled both Fin Superintendent and Maintenance Manager Positions for 8 month period. Developed and executed strategy for improving and sustaining Performance Indicators to improve the Maintenance Aggregate Index and overall department performance. Drove corrective and deficient backlogs to acceptable levels and engaged organization to improve standards and worker behaviors through active in field

observations of both craft and supervisor performance. Sponsored and championed several Plant Health Committee identified system/equipment challenges to improve overall station performance resulting in breaker to breaker performance. Helped develop and implement several fleet initiatives to minimize corporate and site process inefficiencies.

***FIN Senior Reactor Operator*** **Vermont Yankee** March 2009 – Oct 2009
Liaison loaned to Maintenance as a Shift Manager candidate for plant issues requiring immediate attention. MFLS qualified, performs tagging and troubleshooting development & implementation. Operational and risk assessment oriented focus ensures conservative and timely resolution of needed repairs.

***Senior Licensed Reactor Operator*** **Vermont Yankee** June 2007 – Oct 2009
Direct all station operations on shift as the Control Room Supervisor. Qualified Field Support Supervisor and Fire Brigade/Incident Commander. Regularly supports ops work control center as tagging authority.

***Licensed Reactor Operator*** **Vermont Yankee** October 2003 – June 2007
Operate all control room reactor and station controls on a 12 hr shift basis. Lead appendix J leak rate and pressure (PIV) testing as special project coordinator for multiple refueling outages.

***Auxiliary Operator*** **Vermont Yankee** April 1997 – October 2003.
Operate plant systems and perform procedurally directed surveillances under control room direction.
Fire Brigade, OSHA 40 hr trained, Confined Space Rescue, Adjunct Instructor, and EMT qualified.

***Construction Engineer*** **Bechtel** March 1996 to April 1997
Operations Manager for soil vapor extraction, chemical precipitation, groundwater treatment, and PLC based multi-process hazardous waste treatment plants.

***Environmental Engineering Technician*** **Roy F. Weston, Inc** August 1994 – March 1996
Responsible for the operation, maintenance, chemistry, and all record keeping of five separate groundwater recovery and remediation pilot plants. Key member in the design and construction and operation of a 10 million dollar hazardous waste treatment facility.

***Nuclear Propulsion Plant Mechanical Operator*** **United States Navy** April 1988 - April 1994
Strong working knowledge of applied engineering principles from extensive operation and maintenance of nuclear power electrical generating and propulsion systems. Qualified thru ***Engineering Watch Supervisor:*** responsible for the safe and competent operation of a nuclear engine room and all associated support systems. ***QA Supervisor:*** responsible for generating all controlled nuclear work and testing packages for machinery division onboard a 688 Los Angeles Class nuclear submarine.

## QUALIFICATIONS AND RESPONSIBILITIES

***Vermont Energy Partnership Liaison*** Testified on multiple occasions to State Legislators and Committee hearings for positive representation on nuclear related energy issues including dry cask storage, power up-rate, and license renewal.
***Local Energy Committee Co-Chairman*** Worked regularly on residential, town, and state level to increase energy efficiency, promote usage reduction, and save taxpayer dollars thru awareness and conservation.
***Keene Community Kitchen Volunteer*** Current and multiple year member assisting in the preparation and delivery of meals for challenged families in the Monadnock region.

## PROFESSIONAL DEVELOPMENT

Entergy Advanced Leadership Training Program
INPO Developing Leaders Seminar
10CFR50.59 Evaluator Qualified
EOOS (Configuration Risk Monitor) Analysis

Kepner-Tregoe Analysis
Entergy MARC management principle training
Entergy SIS (supervisory interactive skills) training

## TECHNICAL TRAINING AND EDUCATION

Senior Licensed Operator Initial Training, May 2007
Licensed Operator Initial Training including BWR Fundamentals, VY October 2003
Auxiliary Operator Initial Training, VY October 1998
OSHA Health and Safety 1910.120, Westchester, PA, August 1994
Nuclear Propulsion Plant Emergency Welding School, San Diego, CA, March 1990
Nuclear Power Training Prototype, Ballston Spa, NY, November 1989
Nuclear Power School, Orlando, Fl, April 1989
Nuclear Field Academic School, Orlando, Fl, October 1988

NorthStar

October 31, 2017

**Availability Date**
Immediately Available

**Name of Company with Whom Key Person is Employed:**
NorthStar Nuclear Decommissioning Co.

**Education**
Bachelor of Science,
Chemical Engineering,
University of Louisville, 1987

**Citizenship**
US

**Professional Development:**

- USDOE Quality Assurance Training
- HAZWOPER 40 Hour
- RAD II Worker
- OSHA 10 Hour Construction Safety and Health
- DOE EM385 Safety
- EPA Hazardous Waste Site Sampling Course
- EPA region IV standard Operating Procedures Course

## e on n u e ume

**Name of Key Person:** Nelson Langub

**Name of Contractor:** NorthStar Nuclear Decommissioning Co. (NorthStar)

**Position with NorthStar:**

**Operations Senior Project Manager**

**Duties and Responsibilities in Proposed Position**

Mr. Langub is proposed as the Operations Senior Project Manger and will be the primary point of contact and single point of accountability for NorthStar for Decommissioning services.

**Suitability for the Proposed Position**

Mr. Langub has 29 years of relevant professional experience and has served as Project Manager for multiple Design/Build construction projects, including managing infrastructure improvement and installation, facility maintenance, abatement / decontamination / demolition and environmental remediation projects, hazardous waste site clean-up, decommissioning nuclear facilities and landfill construction. Nelson is experienced in various project delivery methods (Design-Build, Construction Management at Risk, Design and Construction Sequencing, EPC, EPCM); project management, construction management, estimating, project controls, and proposal development/management.

## o ect E e ence

*Operations Manager: Old Town Demolition Project, Berkeley, CA - Complete 2016*

Operations Manager to complete the cleanup and removal of excess building facilities, concrete slabs and the remediation of contaminated soil at the circa 1940s and 1950s buildings on the Lawrence Berkeley National Laboratory research facility. The work included demolition of buildings that previously hosted radioactive isotopes, beryllium, and hazardous chemicals as well as asbestos.

*Operations Manager: AJ Blotcky Research Reactor Decommissioning, Omaha, NE - Complete 2015 - 2016*

Operations Project Manager that completed the decontamination and decommissioning (D&D), complete demolition, disposal, Final Status Survey and site restoration of the A.J. Blotcky Reactor Facility (AJBRF) at Omaha Medical Center, which housed a low-power Mark I Training, Research, Isotopes, General Atomics (TRIGA) nuclear research reactor. Completed the demolition and restoration of the facility that included repairs to the concrete floor, backfilling of trenches, pits, former reactor tank with flowable fill and plugged or capped pipe and ventilation system penetrations. The facility structures was radiologically released thru the Final Status Survey and 1,000 cubic feet of debris was appropriately dispositioned.

*Project Manager: USAF Decontamination Remediation and Demolition of Air Force Plant 59, Johnson City, NY - Complete - 2015*

Project Manager to complete demolition on a former US Air Force manufacturing plant 59 that included; the abatement/removal and proper disposal of ACM; removal and proper disposal of PCB contaminated wood/timbers and ORM, e.g. mercury containing switches, fluorescent bulbs, ballasts, lead sheeting, lead-based painted items. etc.; disconnection/cutting/capping of all utilities in coordination with the local utilities and local municipality; disposal/recycle of all demolition produced material not categorized as a regulated waste under the Toxic Substances Control Act (TSCA) and/or the Resource Conservation and Recovery Act (RCRA); disposal of all other contaminated materials in accordance with Federal, state, and local regulations; and restoration of the site

*Project Manager: USCG Cleveland Station Annex Cutter Maintenance Design/Build, Cleveland, Ohio - Complete 2012 - 2013*

Proposal Manager and capture lead ensuring technical and operations personnel understood and followed the proposal development process to ensure timely, compliant and compelling best value proposal submitted to the Client for the win. Completed: Design and Facility Construction. This was a design-build construction for the Boat Maintenance Annex at the US Coast Guard Cleveland Harbor Moorings in Cleveland, Ohio. The project targeted and achieved LEED Gold certification. Includes architectural and engineering design and construction of a one and one half story approximately 8,500 gross square feet Annex Building for the purpose of boat maintenance, Cutter storage and grounds maintenance equipment storage. In addition, the new building will include Station Engineering and Cutter staff offices. Site development was included such as revised and additional parking areas to the east and south and new parking/drive/K12 security fence areas to the northwest and southwest of the new building. Responsible as Proposal lead and capture manager, design coordination, resourcing, procurement of subcontractors and project planning and controls. Utilized P-6 value and cost loaded schedule to track cost and provide earned value reporting and pay application.

*Project Manager: US DOI/National Park Service Design/Build of 3 Residential Housing Areas, Big Bend National Park, Texas. Complete: Jan 2012 to Oct 2012.*

As Project Director, he assisted in the operational execution. New design-build construction scope of work includes the construction of housing for law enforcement personnel at three distinct developed areas within Big Bend National Park. The project consisted of the design/construction of two (2) types of house dwellings that included: six - three-bedroom single family houses and six - three-bedroom duplexes at the three locations. In addition to the Big Bend National Park being an extremely remote location, the housing areas were located at three distinct developed areas within the park that ranged from 20 to 55 miles driving distances between areas resulting in resource logistics becoming the major challenge. Design and construction for the separate sites included upgraded and connected site utilities and other infrastructures, building and foundation system including off-site utility and roadway extensions as well as a new storm-water facility. Utilized P-6 value and cost loaded schedule to track cost and provide earned value reporting and pay application.

*Project Manager: Veterans Administration Barrancas National Cemetery - Design and Construction of Facilities/Infrastructure and Cemetery Improvements, Pensacola Naval Air Station, Florida. - Brownfield Redevelopment - Complete: 2008 to 2011*

Proposal manager for pursuit, including compliance, win strategy, color team reviews and managing multi-staff technical and operation team to a timely and compliant submittal for the win. He transitioned as Project Director to operationally execute the Design and Construction. Architectural and Engineering Design and construction using design / build approach for improvements to an existing national cemetery and expansion involving new infrastructure systems and roadways, new administration/public information building and public restrooms, new office and maintenance building facility, new committal ceremonial building for services, communication system, parking, electrical, water / sewer / fire protection systems, cortege parking, sidewalks, new entrance feature, fences, gates and utilities, installation of 5,000 pre-placed crypts, construction of 1,300 standard single burial plots and 100 cremains plots. Responsible for overall construction, safety, quality, compliance, and performance to design specifications; established and maintained safe work practices and ensured adequate resources (trained personnel and equipment) to complete tasks safely; coordinated overall construction operations and directed and managed project team and subcontractors; ensured construction performed in compliance with specifications, consistent with cost, schedule, and contractual requirements. Responsible as Proposal lead and capture manager, design coordination, resource manning, procurement of subcontractors and project planning and project controls. Utilized P-6 value and cost loaded schedule to track cost and provide earned value reporting and pay application.

*Project Manager: Georgia Power Company Plant Vogtle Building Demolition, Landfill and Firing Range Environmental Remediation Services, Waynesboro, Georgia. - Power Generation - Nuclear - Complete: 2008 to 2009.*

As Proposal Manager, engaged the teams to capture the project by developing win themes, and generated a proposal that was personally presented to several Client decision groups. Transitioned as Project Director to execute the work that consisted of Phase I and II demolition and dismantling services for removal of six buildings and warehouse facilities to clear and prepare 100-acre laydown area for construction of two additional reactor units, and to achieve "clean closure" (soil removal, off-site disposal and soil stabilization) of 40,000-CY private industry landfill containing up to 13,000 CY of construction debris. Services also involved remediation of lead-impacted soil at 2,500-SF former security firing range; removal of six buried fuel storage tanks and two oil/water separators; and closure of range of monitoring wells and soil borings. Responsible for business development, estimating, scheduling and overseeing timeliness, quality, budgets and project execution safety for demolition / environmental remediation / removal phase of project. Responsible as Proposal lead and capture manager, design coordination, resource manning, procurement of subcontractors and project planning, execution and project controls.

*Construction Project Manager: Honeywell. SA 2 Remedial Investigation and Project Construction Management Services, Bayonne, New Jersey. - Industrial / Manufacturing / Infrastructure - Complete: 2007 to 2008.*

Project management, remedial investigation and field activities at two designated sites. Site 144 consisted of 5,650 LF of Bayonne Sewer Pipeline placed in chromium ore process residue backfill covering approximately 5.6 acres of impacted area; Site 166 is approximately 2 acres

within city-owned Rutkowski North 40 Nature Park, impacted by similar chromium ore process residue backfill. Scope of work also included remediation, infrastructure installation and reconfiguration, municipal permit coordination, demolition, soil borings, monitoring well installation, sample collection, groundwater monitoring, and reporting. Responsible as Construction Project Manager - managed performance of project maintaining schedule and cost to completion. Utilized P-6 value and provide earned value reporting and pay application.

*Project Manager: ABB (formerly Combustion Engineering) Windsor Decommissioning of Buildings Complex, Windsor, Connecticut. - Industrial / Manufacturing - Complete: 2005 –2007*

Conducted decommissioning of multiple process buildings at a nuclear fuel complex with floor area totalling 106,000 SF used for nuclear research and fuel fabrication on a 600-acre site, with associated Final Status Survey to release NRC Site License. Reconfigured the site infrastructure for future property sale and redevelopment. Responsible for managing organizational, schedule and production performance including effectiveness of staff managers; reviewed and approved contract submittals and negotiated technical and contractual issues with the client; implemented project-specific QA/QC program consistent with the Corporate QA program and ensured compliance with health and safety and radiation protection requirements for the successful and safe completion of the project. Utilized P-6 value and cost loaded schedule to track cost and provide earned value application.

*Construction Project Manager: U.S. Department of Energy / Bechtel Jacobs Company LLC Melton Valley Solid Waste Storage Area (SWSA) 4 Environmental and Construction, Oak Ridge, Tennessee. - Nuclear and Hazardous Waste - Complete: 2003 to 2005*

Environmental, geotechnical and quality assurance services for design / build delivery, including site capping, soil excavation, hydraulic isolation system design, groundwater treatment, borrow area and haul road development, subsurface groundwater diversion and collection system, wetland restoration and road repairs for 29-acre Solid Waste Storage Area (SWSA) 4 burial ground for low-level radioactive waste and soils from ORNL in unlined trenches and augur holes in Melton Valley Watershed. Design included a gas venting system, composite hydraulic barrier of geo-synthetic clay and membrane liners, geo-synthetic drainage layer, and soil cover material. Responsible for Project Management overseeing preparation of project CPM schedule, cost accounting procedures, health and safety issues including primary compounds for past work such as mixed and radioactive contaminated media and hazardous waste; assisted in design and implementation of landfill, cap and groundwater treatment system.

*Construction Project Manager: U.S. Department of Energy / Fluor Fernald, Inc. Uranium Processing Plant Site Closure Dismantlement and Demolition, Fernald (Cincinnati area), Ohio.*

Decommissioning closure services at 90-building former uranium processing complex on 1,050 acres in southwest Ohio. Facility supplied raw materials for nuclear weapons program from 1953 until closure in 1989; clean-up began in 1992. Work involves removal of building rubble, piping, soil and other components. Work included surface decontamination, dismantlement, segregation, cutting and containerizing all interior and exterior equipment, systems and fixtures, asbestos-containing materials and above- and below-grade masonry and concrete. He was responsible for Project Management and Field Engineering over facility maintenance, demolition, decontamination and remediation projects.

*On-Site Project Manager: U.S. Department of Energy / Fluor Fernald Inc. Site Plant Buildings 5 and 6 Decontamination and Dismantling (D&D), Hamilton, Ohio. - Nuclear / Industrial / Manufacturing - Complete: 1999 to 2001*

Decommissioning services in conjunction with demolition of process buildings 5 and 6 at former uranium processing complex on 1,050 acres in southwest Ohio. Facility supplied raw materials for nuclear weapons program from 1953 until closure in 1989; clean-up began in 1992. Work included surface decontamination, dismantlement (buildings, utility and light poles, pipe racks and fencing), segregation, cutting and containerizing all interior and exterior equipment, systems and fixtures, asbestos-containing materials and above- and below-grade masonry and concrete. Below-grade work included removal of piping, demolition of concrete slab on grade and concrete foundations, and removal of rad-contaminated soil. Responsible for initiating project scoping, cost estimating, work plan preparation, field engineering, demolition supervision craft management and client communication; overseeing preparation of project CPM schedule, cost accounting procedures, health and safety issues included primary compounds for past work included mixed and radioactive contaminated media, hazardous waste, lead contaminated dust, lead contaminated soil and other material handled in production of lead acid batteries treated for removal and offsite disposal.

## Chronological Work History:

*NorthStar Nuclear Decommissioning Co.*

February 2017 to Present

Senior Project Manager

*NorthStar Federal Services, Inc.*

February 2015 to 2016

Senior Project Manager

*Messaros-Langub Realty, Inc*.

Jan 2014 to 2015

Small Business Owner and Licensed Real Estate Agent

*AMEC E&I*

Jan 2011 to March 2013

Senior Project Manager / Proposal and Lead Capture Manager

*MACTEC Constructors / MACTEC Development Corporation*

March 1997 to Jan 2011

Project Director / Sr. PM, Principal in startup of Construction Division (MACTEC, Inc.)

*GNB Environmental, Inc.*

Feb 1992 to Feb 1997

Principal and Senior PM, Principal in startup of Construction Subsidiary (GNB,Inc./Pacific Dunlop LTD)

*OHM Remediation Services Corp*

Feb 1991 to Feb 1992;

PM and Engineer

*Fluor Daniel Environmental Services*

Jan 1990 to Jan 1991

Environmental Scientist, Key staff in startup of Atlanta Area Office

*CDM Federal Programs Corp*

March 1987 – Dec 1990
Environmental Scientist, Key staff in startup of Atlanta Program Office

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Cell – 865-207-1115 slabuy@northstar.com


## C

Mr. LaBuy is a multi-skilled Nuclear Engineer with diverse front-line experience in decommissioning research and test reactors and nuclear facilities, nuclear safety analysis, conduct of operations, project management, and applied engineering. He developed a career foundation in submarine reactor plant operations, electrical maintenance and operations, and mechanical design.

## C

**orthstar cl ar co issioning Co any – an ary r s nt**
Provide nuclear facility decommissioning proposal and project support, including cost estimating and planning.

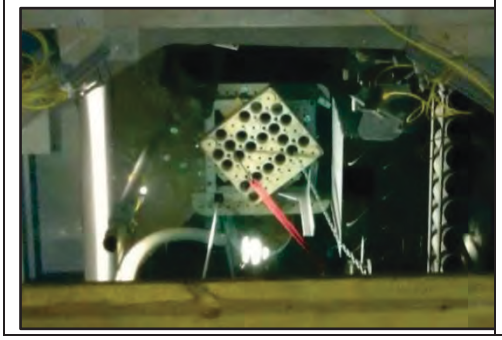
**n rcon r ic s g st – an ary**
Prepared a decommissioning cost estimate for the Brazil Angra Nuclear Power Plants.

**orthstar ral r ic s or rly r ic s – ril – ay**
Provided decommissioning proposal and project support. Awarded LBNL Old Town Demolition Project in Dec 2014; supported project planning and startup. Awarded the VA Blotcky Reactor D&D in April 2015; supported project planning and startup.

**n n nt Cons ltant – c – ril**
Performed fixed price decommissioning project management, nuclear safety, and engineering. Provided proposal support consisting of strategy development, technical approach, bid estimates, and scheduling. Prepared approximately 100 decommissioning cost estimates for DOE, NRC, and International facilities.

**r ic s n n nt Cons ltant –**

**ni rsity at alo**, Buffalo NY. 2012-2013. Managed the Reactor Facility decommissioning project to dismantle, remove, and package high dose rate components up to 500 R/hr, 250 R/hr sources, mixed waste, depleted uranium, systems and components, and concrete bioshield and hot cell structures. Performed on-site project engineering, planning, radiological dose and shielding assessments, and work oversight.



**ni rsity o llinois**, Urbana IL. 2011-2012. Managed the Nuclear Reactor Laboratory decommissioning project to dismantle, remove, and package a Mark II TRIGA reactor. Performed project engineering, planning, and radiological dose and shielding assessments. Work included 60 R/hr reactor component disassembly and packaging, Bioshield concrete wire saw cutting, activated material removal, and system removal. Oversaw asbestos abatement, hazardous material removal, radiological decon, and demolition of the 3,200-square-foot building structure.

**U of Illinois Nuclear Reactor Laboratory Decommissioning Project Letter to LVI Vice President**

"Scott LaBuy provided superb project management and oversight. His attention to detail and safety created a smooth and efficient work environment that brought the project to completion on time and budget."

*Richard Holm, Reactor Administrator*

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Supported proposal and project startup efforts for the following awards: Paducah C-340 and the Hanford 300 Area PRTR, 340 Vault, and TRIGA removal. Supported efforts for award of a MAGNOX Framework contract to Squibb/LVI. Performed task order bid walks and proposal efforts in the UK.

Performed pre-bid walks at West Valley, BNL, Paducah, Portsmouth, ANL, Hanford, Nevada Test Site, LANL, LBNL, ETEC, Rocky Flats, Oak Ridge Sites, Fernald, Fermi 1, Zion Station, Vermont Yankee, Humboldt Bay, Hematite Fuel Fab, Columbia Fuel Fab, GE Wilmington Fuel Fab Facility, Sturgis Ship Reactor Plant, and various other sites.

**ni rsity o ri ona**, Tucson AZ. 2010-2011.
Performed project management, project engineering, and quality assurance assessments to dismantle, remove, and package a Mark I TRIGA Reactor and ancillary components. Dispositioned pool water, reactor tank gunite, and concrete.

**il ings an** , Oak Ridge. 2010.
Project Manager for the demolition of an 83,500 sq. ft. four story structure and a 19,520 sq. ft. three story building at the Y-12 National Security Complex in Oak Ridge, TN. Utilized an ultra-high reach demolition machine. Transported over 1,200 loads to the EMWMF landfill totaling approximately 23,000 cubic yards of radiological debris.

**all citos cl ar C nt r**, Sunol CA. 2007-2008.

Performed project engineering and planning to D&D the VBWR and EVESR reactor plant systems and components. Managed EVESR reactor system and component dismantlement and removal operations. Performed air dispersion calculations.

**ni rsity o Washington**, Seattle WA. 2006.

Performed project engineering to dismantle the Argonaut training reactor, bioshield concrete, and ancillary systems.

, Oak Ridge TN. 2004-2006. Prepared several Requests for Equitable Adjustment for LVI's subcontract to perform asbestos abatement in several ETTP lab area buildings. Performed claims analysis through mediation.

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**rookha n ational a** . 2005. Performed work planning and operations management to decommission a large elevated bag-house filled with radiologically contaminated asbestos.

**lo al cl ar ls**, Wilmington NC. 2004. Prepared work control documentation to remove equipment and fissile materials from a UF6 Vaporization Room.

**H atit l a rication acility** 2003-2004. Prepared a Ventilation Assessment to evaluate a system deactivation sequence to satisfy NRC license requirements. Performed an air dispersion accident analysis to support ventilation system deactivation.

**n rcon r ic s n n nt Cons ltant**

**ni rsity o ri ona**. 2009. Prepared a Decommissioning Plan for the university research and test reactor, which was submitted to and approved by the NRC.

**Hon y ll tro olis lant**. 2007-2010. Performed an evaluation of the existing Integrated Safety Analysis (ISA), including adequacy of "Items Relied on For Safety" for the 10CFR40 uranium conversion systems and processes. Performed system walk downs and operator interviews to verify implementation. Prepared an ISA Summary, which is similar in format and content to a DOE DSA. Prepared a comprehensive Project Plan to develop an ISA revision to implement more rigorous nuclear safety requirements, in accordance with 10CFR70 guidance.

**H ol t ay o r lant** . 2008. Performed project engineering and scheduling to transfer and package approximately 600 cubic feet of 10CFR61.55 Class C ion exchange resin for processing and ultimate disposal at Barnwell.

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**C o Cana a**. Performed dose rate and shielding analyses for an Underground Storage Tank Remediation Project at Chalk River Laboratory.

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Successfully prepared bid estimates for security services at U.S. Embassies, and for security support contracts in IRAQ and Afghanistan.

**Cost Cons ltant an to ay**

Performed claims consulting and cost analyses on ETTP 3-Building D&D Project. BNFL had compiled Requests for Equitable Adjustment in excess of $200M.

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***Eagle vs Bechtel Jacobs Litigation**, Knoxville, Tennessee.* Provided bid cost validation and testimony as an expert cost witness at a Bench Trial in the Tennessee Eastern District Court.

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**rnal** . Prepared Nuclear Safety Basis documentation and Accident and Dispersion Analyses in support of the Jacobs Engineering Group Fernald Silos project. Silos 1 and 2 contained 4,700 Ci of Ra-226. Performed numerous USQ evaluations. Prepared ALARA analyses and performed several dose rate and shielding calculations on Silos 1, 2, 3, the Transfer Tank Area, and to support the design of the Fernald Silos Remediation Facility.

**ak i g ational a oratory**. Prepared a Documented Safety Analysis in accordance with 10CFR830, including hazard categorization and accident analyses for the ORNL T1, T2, and HFIR tanks fluidic mixing and resin destruction of 5,650 gallons (620 Ci). Prepared radiological dose assessments to allow AEA Technology Services to perform tank remediation.

**ak i g ational a oratory** Managed a one-year, $2.7M fixed price FFA underground storage tank remediation project at ORNL. Managed site operations for the first 6 tanks and transitioned to Project Manager for the remaining 11 tanks. Performed project planning and radiological dose assessments to remove high source term tank sludge. Site operations included sluicing and slurry transfer of more than 3,000 gallons (2,500 Ci) of sludge, and subsequent grouting of 17 tanks.

**C n rgy r ic s an ay**

**rgonn ational a oratory** . Managed CP-5 Reactor Facility D&D operations for the 2nd phase of the one year fixed price $3.5M project. Operations included process systems removal, hot cell demolition, concrete diamond wire cutting, large diameter concrete coring to remove fuel storage tubes, overhead crane dismantlement, waste management, Brokk operations, and extensive decontamination of metals and concrete throughout the facility to free release criteria. Coordinated procedure writing, facility operations, subcontracts, labor resources, activity sequencing, and financial reporting.

**ak i g** , . Managed the initial phase of a 3 year, $12M fixed price project to D&D the highly contaminated K-1420 Uranium Recovery and Decontamination Facility. Performed K-1420 D&D Project Planning and Facility Characterization. Coordinated the preparation of MC&A Plan and criticality safety analyses. Managed the collection and analysis of residual fissile materials and subsequent facility downgrade from Category II Nuclear. Removed numerous K-1420 high-bay systems, the K-1421 Incinerator Building, and Tank Farm. Performed project planning and operations for RCRA closure of the K-1417B Yard.

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Planned and managed Decommissioning project operations. Prepared D&D Plans, Health and Safety Plans, Characterization, NEPA, Dose Assessments, Site Release, and cost control documentation. Characterized a pool-type reactor facility. Dismantled highly contaminated equipment and a structure that had been used for spent nuclear fuel research. Designed and fabricated a shielded shipping and storage drum for remote-handled TRU sources. Characterized, planned, and managed the D&D of several systems and structures. Prepared Hazard Categorization and Safety Analysis documentation for decommissioning projects. Performed long range site wide D&D planning, including the preparation of cost estimates for several hundred facilities.

***Personally awarded the coveted Lockheed "Top Performance Award", a top 1% award among 8000 employees.***

Prepared detailed characterization and project plans for a complex spent nuclear fuel removal project. Participated on an INL site-wide SNF task team for consolidation of spent nuclear fuels.

Established a spinoff company in 1996 with 3 co-workers, endorsed by LMITCO to promote small business development. The company was acquired by NSC Energy Services.

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Performed mechanical design tasks for plant modifications. Managed, expedited, and directed preparation of a detailed construction package to modify the control room emergency ventilation system. Qualified as a 10CFR50.59 screener and evaluator for plant modifications. The plant was permanently shut down in 1993.

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Provided technical expertise to support the New Production Reactor (NPR) design effort. Advised DOE on Modular High-Temperature Gas-Cooled Reactor (MHTGR) reactor internals and emergency core cooling design factors. Participated in development meetings at General Atomics, ETEC, and DOE Headquarters. Analyzed fuel and target production options and the entire MHTGR fuel cycle. Prepared target irradiation and tritium extraction test plans and reports. The NPR program was terminated in 1992 after the end of the cold war and policy decision to dramatically reduce the nuclear weapons stockpile.

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Performed transmutation Monte Carlo analyses, as a Research Assistant, for disposition of spent nuclear fuel. Performed health physics tasks at the university TRIGA facility. Performed gamma spectroscopy analyses. Coursework focused on reactor physics and thermal-hydraulics performance analysis.

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Qualified as Electrical Operator, Shutdown Reactor Operator, and Radiological Controls Worker. Supervised and trained personnel in the operation and maintenance of electrical power generation and distribution systems, submarine reactor and steam plant operations, and instrumentation and controls. Applied hands-on operations and maintenance solutions using broad, multi-disciplined engineering knowledge. Attended Naval Nuclear Power School in Orlando FL and S5G Prototype at NRF Idaho.

Specially selected to maintain a prototype submarine gas management system, which was first installed on SSBN 626, and to attend extensive training sessions at the design/manufacturer, Hamilton Standard.

***Awarded Commendation from Commander Sub Group Two, for performance in maintaining 300 kW motor generators operational.***

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## H

2017 – Present – Northstar Nuclear Decommissioning Company
2016 – 2017 Enercon Services
2015 – 2016 – AECOM (Formerly URS)
2014 – 2015 – Northstar Federal Services (Formerly LVI Services)
2003 – 2014 – Independent Consultant - LVI Services, Enercon, Restoration Services, EODT, BNFL
2000 – 2003 – Project Engineer and Project Manager – TPG Applied Technology
1998 – 2000 – Project Manager - NSC Energy Services
1993 – 1998 – Project Engineer and Project Manager – Lockheed Martin Idaho Technologies
1992 – 1993 – Design Engineer, Portland General Electric, Trojan Nuclear Plant
1990 – 1992 – Systems Engineer, EG&G Idaho
1987 – 1990 – Student, Research Assistant, Radiological Technician, Oregon State University
Naval Reserves, Industrial Painter during summers.
1980 – 1986 – Nuclear Plant Operator, Electrician, U.S. Navy

## C H an

B.S. Nuclear Engineering, with high scholarship, Oregon State University, 1990
Institute of Nuclear Power Operations Scholarship, 1988 - 1990
Naval Nuclear Power Training Unit, Idaho Falls, 1982
Naval Nuclear Power School, Orlando FL, 1981
Past Member, American Nuclear Society
Past Member, Health Physics Society

**Matthew J LaBarge** **Technical Services Project Manager**

Matt has over 25 years of diverse experience relating to waste management, project management, decontamination, operations, regulatory compliance, and safety primarily within the DOE complex. Matt has been deployed at four DOE facilities for long term assignments and many other sites for short durations.

Matt has worked with a broad cross section of personnel within DOE and the DOE contractor community, including operators/technicians, technical staff and senior executives. Matt finds innovative solutions to problems and has been instrumental overseeing the implementing the solutions to their successful conclusion.

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**WCS Role and Responsibilities**

Provide technical expertise to WCS generators and the operating facilities to ensure waste is received safely, compliantly, and in a cost effective manner. Provides support to the Business Development team in an effort to provide winning strategies. Supports operations, safety and licensing divisions and works closely with management to produce revenue and profitability.

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**Prior Professional Experience**

**Uranium Disposition Services, LLC, 2009 to 2010**

***Waste Management and Transportation Manager*; Paducah, KY**

Responsible for all waste management and HAZMAT transportation at the Paducah DUF6 Conversion Plant. Instrumental in readiness preparations for Paducah and Portsmouth, Ohio plants.

**EnergySolutions, Inc., 1996 to 2009**
***Project Manager, Various Locations in Kentucky, Ohio and New York***
Manage all phases of radioactive (low-level, TRU and mixed) and hazardous waste management at Department of Energy (DOE) facilities in Paducah, Brookhaven and Fernald. Facilitated the disposal of wastes at various DOE and commercial facilities. Managed projects and operations with a staff of up to 50 individuals. Developed and gained approval for multi-million dollar budgets. Conceptualized and established performance measures, and ultimately managed operations to achieve outstanding performance. Led the effort to realign the staff (including the recruitment of new staff) to improve the diversity of the organization. Established an excellent rapport with bargaining unit represented personnel.

Specific project experience includes the following:

- **Paducah Waste Disposition Project Manager; Paducah, KY**

In support of the Paducah Environmental Remediation Project, responsible for the disposition of all legacy and newly generated wastes, and landfill operations. Included the operation and maintenance of eight facilities (some RCRA and TSCA regulated) and a Subtitle D Landfill.

- **Technical Manager/Project Manager, Waste Management Support; Fernald Closure Project (FCP); Fluor Fernald, Inc.; Fernald, OH**

Managed all phases of radioactive (low-level, TRU and mixed) and hazardous waste management. Developed work plans and work authorizations for the treatment packaging and shipment for a number of problematic waste streams. Worked directly with operations personnel to ensure the work was conducted safely and according the work authorization.

- **Project Manager, Boneyard Waste Project; Brookhaven National Laboratory; Bechtel National; Upton, NY**

Served as the Laboratory's Project Manager for the ~$3 million project designed to package, ship, treat and dispose thousands of cubic feet of legacy waste at the old Waste Management facility (Boneyard). Instrumental in awarding 2 out of 3 major subcontracts. Effectively managed multiple subcontractors while keeping the project on schedule and budget.

- **Operations Manager, Waste Management Division; Brookhaven National Laboratory; Brookhaven Science Associates; Upton, NY**

Responsible for the management and operation of the Laboratory's waste management program. Responsible for the day-to-day operations of nine different facilities. Managed a staff of 20 technicians, supervisors and engineers. Developed the Divisions annual operating budget (~$7 million) and served as the lead individual in negotiating the annual budget with he DOE field office. Was a key member of the team responsible for the Division earning ISO 14001 registration. Spearheaded efforts to improve conduct of operations and increase efficiency.

- ***Team Leader, Waste Management Support; DOE Hanford Reservation; Fluor Hanford Company; Richland, WA (1997-1998)***

Responsible for the process planning and development, cost estimating, and scheduling of all waste management production activities (~$50M) on the Department of Energy's (DOE) Hanford Site. Created the team and the standard methods for conducting business. Established a strong project management discipline using the latest in software and information systems. Projects were routinely completed on schedule and within budget.

- ***Process Control and Receiving Manager, Waste Management Support; DOE Hanford Reservation; Fluor Hanford Company; Richland, WA, 1996 to 1997***

Managed the waste management facility's $20 million budget (including negotiating with DOE to ensure the budgets were approved in a timely manner), production schedules, and work control process. Ensured all contract deliverables were met on time, significantly under budget and exceeded customer expectations. Interfaced with the sales staff to meet customer's needs for waste management services. Was responsible for identifying, evaluating, and implementing new technologies. Managed the development of an integrated schedule for all production, maintenance and routine activities. Supervised a staff of 15.

**Westinghouse Hanford Company, Richland, WA, 1990 to 1996**

- ***Waste Management Operations Supervisor, DOE Hanford Reservation (1993-1996)***

Responsible for all operations associated with the DOE Hanford Site low-level and high-level decontamination and waste repackaging facilities. Primary activities included directing a staff or exempt and bargaining unit personnel, soliciting customers, ensuring personnel safety, maintaining proper conduct of operations, complying with all applicable regulations, and coordinating maintenance and facility upgrades.

- ***Advanced Scientist, DOE Hanford Reservation, 1990 to 1993***

Responsible for the DOE's Hanford Site solid waste management facilities maintaining compliance with environmental regulations, mainly RCRA. Interfaced between the facilities, the Department of Energy, and State and Federal regulators. Was instrumental in resolving major site-wide compliance problems, including several formal enforcement actions. Assisted with the preparation and review of facility RCRA Part B permits and closure plans. Provided guidance on a variety of site-wide environmental issues.

**Andrews Environmental Engineering, Inc., Springfield, IL, 1989 to 1990**
***Environmental Planner***
Worked with Project Managers on an array of solid waste (hazardous and non-hazardous) projects. Formulated applications for compost and waste stream permits. Participated in environmental audits. Oversaw construction projects and performed groundwater monitoring activities.

**Matthew J LaBarge**

**Education**

M.A., Environmental Planning (GPA 4.0), University of Illinois, 1989

B.A., Environmental Studies, University of Vermont, 1986

**Professional Training**

Kentucky State Licensed Landfill Manager, 2006

Registered Environmental Manager, National Registry of Environmental Professionals, 1999

OSHA 1910.120 8-hr Hazardous Waste Training Refresher, 2002

OSHA 1910.120 8-hr Hazardous Waste Training Supervisory Course, 2001

Project Management Professional Certificate, University of Findley, 2002

ISO 14000 Implementation, 1999

DOT certified HAZMAT shipper, 2010

RCRA Fundamentals, 2009

CERCLA/RCRA Implementation, 1992

# TERRY GARRETT, PE

## Project Manager

Mr. Garrett has over 37 years of combined expertise in organizational management, strategic planning, project management, and design, plant, and nuclear engineering. Prior to joining Burns & McDonnell, he served as Vice-President on-loan to INPO in the role of Team Leader for plant evaluations focusing on Organizational Effectiveness. In addition, Mr. Garrett has held the positions of Vice President Engineering of Wolf Creek Nuclear Operating Corporation, Executive Director for the Strategic Teaming and Resource Sharing (STARS) alliance, Manager Design Engineering, Manager Nuclear Analysis, and Manager Nuclear Safety Analysis.

### EDUCATION

- MS, Mechanical Engineering
- BS, Nuclear Engineering

### REGISTRATIONS

- Professional Engineer (KS)

**3** YEARS WITH BURNS & MCDONNELL

**37** YEARS OF EXPERIENCE

Senior Reactor Operator Certification equivalent – completed the SRO training program at Wolf Creek Generating Station, a two year program that included outage and operation time on shift.

### Burns & McDonnell

2013 – Present

***Project Oversight.*** Senior Engineering and Project oversight including the Diablo Canyon Computational Fluid Dynamic Model for direct hot winds and high wind conditions, Third Party Review of the Inverter Replacement project at the Palo Verde Nuclear Generation Station, and Owner Engineering Services for the ISFSI Project at the San Onofre Nuclear Generating Station.

***Senior Project Consultant.*** Project, Program and Client Manager for Nuclear Projects. Senior Engineering and Project Consultant for the $10 billion / 10 year Ontario Power Generation Darlington Refurbishment Program. Engineering consulting to Ontario Power Generation Pickering Nuclear Plant.

### Institute Nuclear Power Operations (INPO)

2011 – 2013

***Team Leader***

- Vice-President on loan from Wolf Creek Nuclear Operating Corporation to INPO
- Reported directly to the Deputy Director Organizational Effectiveness in the Plant Evaluations Department, INPO
- Responsible for leading evaluation teams and performing operational assessments for domestic nuclear power stations
- Responsible for evaluating and assessing corporate governance and oversight of the station, station adherence to standards and accountability models, and execution of operations, maintenance, and engineering departments

### Wolf Creek Nuclear Operating Corporation

2005 – 2011

***Vice President Engineering***

# TERRY GARRETT, PE
(continued)

- Reported directly to the President and Chief Executive Officer and responsible for providing overall program technical and administrative direction for the Engineering department
- Officer of the Corporation
- Responsible officer for licensing the corporation to practice Engineering in Kansas
- Managed 5 divisions and over 150 personnel within the Engineering department which includes the following areas of responsibility and expertise: Design Engineering, Plant Engineering (includes System Engineering), Nuclear Engineering, and Project Engineering

## Utilities Service Alliance, Inc.

2002 – 2005

***STARS Executive Director***

- Responsible for managing and directing all alliance activities for the Strategic Teaming and Resource Sharing (STARS) alliance members: STP Nuclear Operating Co.; Diablo Canyon Power Plant – Pacific Gas & Electric; Comanche Peak Power Plant – TXU Electric; Callaway Plant – AmerenUE; Palo Verde Nuclear Station – APS; Wolf Creek Nuclear Operating Corporation
- Responsible for implementing the STARS alliance governance and oversight model

***Management Council Chairman***

- Responsible for managing and directing alliance activities for the members to the Utilities Service Alliance, Inc.

## Wolf Creek Nuclear Operating Corporation

1986 – 2002

***Manager Strategic Initiatives***

- Responsible for strategic and all alliance activities for Wolf Creek Generating Station including the Utilities Service Alliance, Inc.
- Responsible for developing the governance, oversight, and management model for the Strategic Teaming and Resource Sharing alliance

***Manager Design Engineering***

- Responsible for design functions including electrical, mechanical, civil, piping, and designing modifications, maintaining configuration control, and maintaining the design basis of Wolf Creek Generating Station

***Manager Nuclear Engineering***

- Responsible for nuclear fuel procurement, fabrication, and delivery
- Responsible for directing nuclear fuel reload design methods development, performing fuel reload designs, performing nuclear fabrication audits and surveillances and establishing design control procedures
- Responsible for directing the activities in the areas of core thermal hydraulics for reload design analysis, transient and accident analyses, radiological consequence analyses and developing design methods reports

# TERRY GARRETT, PE
(continued)

- Responsible for developing a Level II probabilistic risk assessment power plant model, performing a core damage assessment and consequence analysis, and performing containment consequence analyses

***Manager Nuclear Safety Analysis***

- Responsible for directing nuclear fuel reload design methods development, performing fuel reload designs, performing nuclear fabrication audits and surveillances and establishing design control procedures
- Responsible for directing the activities in the areas of core thermal hydraulics for reload design analysis, transient and accident analyses, radiological consequence analyses and developing design methods reports
- Responsible for developing a Level II probabilistic risk assessment power plant model, performing a core damage assessment and consequence analysis, and performing containment consequence analyses

## Kansas Gas & Electric

1982 – 1986

***Lead Nuclear Safety Analyst, Nuclear Engineering Department***

- Responsible for directing the technical activities of the Safety Analysis group, providing thermal hydraulic and accident analyses, and developing analytical methods
- Developed a methodology for calculation and control of Limiting System Safety Settings and Limiting Conditions of Operation, methodologies for radiological and containment consequence analysis, a critical heat flux correlation for predicting departure from nucleate boiling and performed safety evaluations to demonstrate that plant changes have not degraded or reduced the margin of safety

***Staff Engineer, Nuclear Engineering Department***

- Developed a RETRAN code model to simulate the thermal hydraulic and reactor kinetic response for a Westinghouse PWR, a VIPRE code subchannel model of the reactor core to predict departure from nucleate boiling, directed the re-analysis of the SGTR even and submitted the report to the Nuclear Regulatory Commission, participated in a mini PRA plant safety study, and prepared safety-related procedures for documentation and qualification of technical computer codes and calculation preparation

## Westinghouse Electric Corporation

1978 - 1982

***Staff Engineer, Bettis Atomic Power Laboratory***

- Performed core thermal and hydraulic analysis for the light water breeder reactor project, performed thermal hydraulic analyses of various irradiated fuel handling and storage designs, analyzed plant scram and reactor coolant system data for abnormal operating trends, and designed, prepared procedures and provided technical support for thermal and hydraulic tests

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Djordan@Northstar.com

# Daniel Jordan

**Citizenship**

- US Citizen

**Education/Qualifications:**

- Naval Nuclear Power School
- US Naval Engineering Laboratory Technician
- US Naval Machinist Mate
- Radwaste Supervisor, RP Shift Supervisor, Radiation Safety Technician, Calvert Cliffs NPP INPO accredited program
- RSO Energy Solutions Clive Disposal Site
- NRRPT Certification
- 49 CFR Subpart H Training RCRA and Rad
- RWII and HAZWOPPER Certifications
- NRC 79-19 Trained
- First Line Supervisor Training
- Facilitative Leadership Training
- Technical Leadership Training
- Shasta College

**Experience Summary**

Mr. Jordan is now the Director of Health Physics and Waste Operations for NorthStar Nuclear Decommissioning Company where he manages the, development, implementation, and maintenance of the radiation protection and waste management programs associated with the decommissioning of nuclear sites, specifically the Vermont Yankee Nuclear Power Station. Mr. Jordan has over 30 years of radiation protection and waste management experience and is certified by the National Registry of Radiation Protection Technologists. Mr. Jordan has extensive experience in operational health physics, nuclear reactor decommissioning, regulatory compliance, radioactive and hazardous waste remediation, characterization, transportation and disposal. Mr. Jordan has extensive experience managing and implementing radiation protection and waste management programs, ensuring compliance with radioactive materials licenses, ALARA principles, radioactive and hazardous waste characterization, transportation, and disposal. Mr. Jordan is also an experienced training instructor in the areas of radiation protection, and radioactive/hazardous waste characterization, storage, transportation, and disposal.

**l ant ri nc ast y ars –** Currently NorthStar Nuclear Decommissioning Company at Vermont Yankee.

**Wast anag r a Cross oiling Wat r actor C W**

Responsible for the implementation and maintenance of the radioactive and industrial waste management programs including RCRA and TSCA, providing field waste and environmental management support for all D&D activities.

**Wast anag r a r nc rk l y ational a oratory**

Responsible manager of the Radiation Protection Program. Responsible for hazardous waste characterization and disposition. Responsible for developing hazardous waste disposition and shipping procedures, a QA Plan, and a Waste Management and Transportation Plan to support the demolition of Old Town Phase One project. Responsible for planning work and developing work packages to support the demolition of Old Town Phase One project.

**Wast cialist an no r cl ar n rating tation**

Responsible for the characterization, transportation, and disposal of highly radioactive legacy waste.

**Wast anag r W stingho s Walt ill co issioning**

Responsible for the contract management and implementation of radioactive and Resource Conservation and Recovery Act (RCRA) waste characterization, transportation, and disposal programs for the Waltz Mill remediation project.

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Djordan@Northstar.com

# Daniel Jordan

**Wast anag r ni rsity at alo cl ar actor co issioning**

Responsible for the contract management and implementation of radioactive and RCRA waste characterization, transportation, and disposal programs for the University at Buffalo Reactor D&D.

**Wast anag r ni rsity o llinois cl ar actor co issioning**

Responsible for the contract management and implementation of radioactive and RCRA waste characterization transportation and disposal programs for the University of Illinois Reactor D&D.

**Wast anag r ni rsity o ri ona cl ar actor co issioning**

Responsible for the management and implementation of the site radiological protection program and the site radioactive and RCRA hazardous waste characterization, transportation, and disposal programs associated with the decommissioning of the University of Arizona TRIGA test reactor.

**Wast Cons ltant Hon y ll Con rsion tro olis Works**

Assisted Honeywell to develop successful radioactive waste and RCRA waste management programs. Responsible for the oversight and implementation of the site radioactive waste characterization, transportation, and disposal program associated with the operation of a uranium hexafluoride manufacturing facility. Successfully aided Honeywell Metropolis Works in disposing of over 40 million pounds and 1 million $ft^3$ of radioactive and hazardous waste in a cost-effective manner resulting in a cost savings for Honeywell of over $50 million.

**Wast anag r W stingho s all citos oiling Wat r actor W**

Responsible for the oversight and implementation of the site radioactive waste characterization transportation and disposal program associated with the decommissioning of the Vallecitos Boiling Water Reactor.

**Wast anag r ni rsity o Washington st actor co issioning**

Responsible for the implementation and management of a supporting health physics program to perform decommissioning work including radiological job coverage, ALARA engineering, radiological instrumentation, dosimetry, and FSS. Responsible for the management and implementation of the radioactive/hazardous waste characterization, transportation, and disposal programs.

## th r l ant ri nc gr at r than y ars

- Site Radiation Safety Officer / Waste Manager, Energy Solutions Clive Disposal Facility
- Waste Supervisor / Radiation Protection Supervisor, Calvert Cliffs Nuclear Power Plant
- US Navy Nuclear Engineering Laboratory Technician, USS Sam Houston, USS Simon Bolivar

**POSITION:** (SAFSTOR 3) ISFSI **RP and Environmental Program Coordinator**
**REPORTS TO:** ISFSI Senior Manager
**DEPARTMENT:** ISFSI Organization
**EMPLOYMENT STATUS:** Regular, Exempt

**ROLE:** The ISFSI RP and Environmental Program Coordinator's primary role is to support the day to day operation of the VY Independent Spent Fuel Storage Installation (ISFSI). This includes oversight of site radiological controls, promoting and enforcing ALARA practices and conducting both radiological and environmental monitoring and sampling, shipping, analysis, and recordkeeping. This may include managing the work of contractors, and assisting in the implementation of project work in conjunction with the ISFSI Senior Manager and Operations Specialist for modifications to the ISFSI. The Environmental Program Coordinator will also develop and provide training, and implement processes and procedures as a Subject Matter Expert (SME) for operation and maintenance of ISFSI radiological and environmental monitoring programs and equipment and controls. The candidate will assist to maintain a cooperative, motivated, successful team and promote a Safety Conscious Work Environment.

**QUALIFICATIONS:**
Candidate should have knowledge and experience with nuclear radiological and related environmental program requirements and controls. Candidate should have a Bachelor Degree in Engineering or Science or Equivalent and 8 years industrial/power plant experience of which 5 years shall be in a supervisory position and nuclear experience. Formal training in radiation protection required, certification by the American Board of Health Physics is preferred. Aptitude for training and familiarity with regulatory compliance with 10CFR Parts 50 and 72 a plus.

**DUTIES/RESPONSIBILITIES**
Candidate must exhibit qualities that will support the SAFSTOR 3 ISFSI mission. These include the ability to handle multiple tasks, to work as a team member, be a self-starter and motivated to get work done on an expedited basis. Team member must be able to anticipate error likely situations with a questioning attitude.

SAFSTOR 3 **Technical Specialist** responsibilities include:

- Interface with the Security Staff to ensure the processes and procedures are effectively implemented.
- Assist in the implementation of the preventative and corrective maintenance program.
- Ensure the Site complies with Local, State and Federal regulations.
- Assess site activities and recommend and/or develop improvements in processes, procedures and training.
- Fix, install, test, calibrate, and repair ISFSI radiological and environmental monitoring equipment. This includes directing or working with contracted personnel to support the SAFSTOR 3 ISFSI mission in an efficient, safe, and quality manner.
- Assist with the annual budget development and implementation of the approved budget.

- Assist with the implementation of the Corrective Action Program (CAP) to ensure that it is effective by fostering the identification of issues at a low threshold.
- Ensure that required ISFSI regulatory issues are identified, thoroughly documented, and appropriately dispositioned.
- Perform or assist with Regulatory Reviews and independent Safety Reviews.
- Assist with the development and implementation of annual site Goals and Management Action Items.
- Support a Safety Conscious Work Environment (SCWE) and safety culture that is free of Harassment, Intimidation, Retaliation and Discrimination (HIRD).
- Perform all assigned tasks in conformance with established procedures and company policies.
- Keep ISFSI Senior Manager cognizant of the status of all assigned work and of any problems that arise.
- Properly document all data and information collected during the performance of assigned tasks.
- Recommend and implement changes to procedures and equipment as identified during the course of performing assigned work.
- Maintain personnel radiological exposure as low as reasonably achievable.
- Maintain effective communications with other employees to ensure that those with a need to know are kept cognizant of events in an effort to reduce delays, resolve conflicts, and expedite resolution of problems.
- Perform such other duties that may be assigned.

**WORK SCHEDULE:** 40-hour work week; overtime as required.

# APPENDIX E

# Decommissioning Experience Project Profiles

# A. J. Blotcky Reactor Facility Decommissioning

| | |
|---|---|
| Client | Omaha VA Medical Center |
| Location | Omaha, NE |
| Completed | May 2016 |
| NRC | NRC License Number R-57 terminated July 22, 2016 |
| Health & Safety | Zero NRC Violations or OSHA Recordable Injuries |

## Nuclear Reactor Facility Decommissioning

NorthStar was selected as the prime contractor to decommission the A.J. Blotcky Reactor Facility (AJBRF) within the Omaha VA Medical Center. Owner requirements included termination of Nuclear Regulatory Commission (NRC) operating License Number R-57 and unrestricted release of the reactor facility and adjacent areas. The Omaha VAMC facility, where the AJBRF was located, will continue to function as a VA hospital post decommissioning.

NorthStar completed the decontamination and decommissioning (D&D), including complete dismantlement, disposal and site restoration of AJBRF. The facility housed a low-power Mark I Training, Research, Isotopes, General Atomics (TRIGA) nuclear research reactor. NRC license termination was completed on July 22, 2016.

The TRIGA reactor assembly was located in a below-ground 20 foot deep steel reactor pool/tank structure with only vertical access to the core. The reactor assembly contained a graphite-reflected fixed core constructed of aluminum resting on a platform that raises the lower edge of the assembly about 2 feet above the tank floor.

The reactor assembly and portions of the reactor tank and surrounding concrete were radioactive due to neutron activation during reactor operations.

## NorthStar's Scope of Work Included:

- NRC License Termination for Site Redevelopment
- Radiological Waste Removal and Management
- Reactor Component Removal
- Activated & Contaminated Concrete Removal
- Facility and Auxiliary Systems Removal
- Facility Decontamination
- Radiological Waste Transportation and Disposal

## Facility Demolition and Site Restoration

NorthStar completed the demolition and restoration of the facility that included repairs to the concrete floor, backfilling of trenches, pits, former reactor tank with flowable fill and plugged or capped pipe and ventilation system penetrations. The facility structures were radiologically released thru the Final Status Survey.

## Final Status Survey

The AJBRF was divided into survey units consistent with the classifications established in the Decommissioning Plan and Final Status Survey (FSS) Plan. Surveys were conducted by qualified survey technicians using instrumentation with sufficient sensitivity to observe levels of radioactivity at the prescribed fraction on the screening criteria. During the FSS, the NRC conducted independent and in-process inspections of the decommissioning activities and a confirmatory radiological survey. The FSS was received by the NRC and the AJBRF License was formally terminated on Friday July 22, 2016.

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# University at Buffalo Material Research Center

| | |
|---|---|
| Client | State University of New York |
| Location | Buffalo, NY |
| Completed | December 2013 (D&D) |
| NRC | Termination of License No. R-77 Pending. |
| Health & Safety | Zero NRC Violations or OSHA Recordable Injuries |

## Nuclear Reactor Facility Decontamination & Decommissioning

NorthStar completed the decontamination and decommissioning (D&D), complete demolition, disposal and site restoration of the University at Buffalo's Material Research Center (BMRC), which housed a high dose rate nuclear reactor.

The BMRC was a reactor facility with a pool-type reactor. The reactor operated until 1994. Fuel was shipped from the facility in 2005. The facility was comprised of a tri-level containment building and a 5,500 square foot tri-level laboratory wing.

### Radiological Waste Removal and Management

Working within the regulatory framework of the Nuclear Regulatory Commission (NRC), Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Department of Labor (DOL), and NY State Department of Health, contaminants were removed and included neutron-activated aluminum, steel, and concrete.

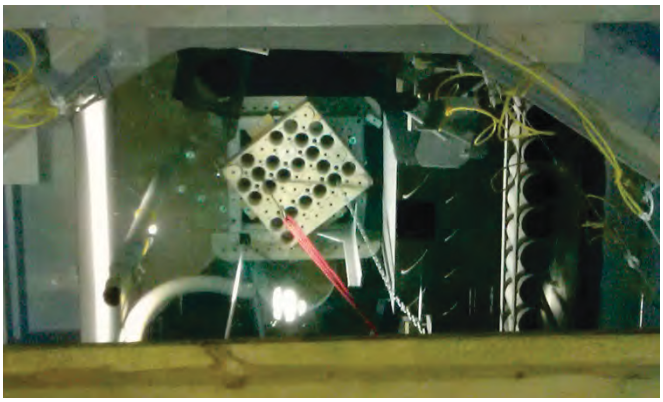
### Reactor Component Removal

NorthStar removed the control blade drive mechanisms, control blade guide tubes, irradiation and experimental standpipes and devices, reactor bridge, fuel racks, reactor instrumentation, reactor tank ancillary items, such as lighting and miscellaneous items that were stored in the tank. The reactor components were removed in phases.

The 500 R/hr control blades were loaded, underwater, into a specially fabricated, shielded, storage container, which reduced the dose rate

to project staff. After being placed into a shipping box and grout macro-encapsulated the waste was ready for disposal.

The reactor grid plate, with a dose rate of 40 R/hr, was unbolted and packaged into a specially-fabricated shielded container, placed in temporary storage. NorthStar also removed several components and bolts measuring up to 8 R/hr and placed those items in shielded packaging and temporary storage.



*Grid plate unbolted from support stand and ready for packing*

NorthStar then removed the remaining fuel storage racks, thermal column nose piece, dry chamber nose piece, the core support plenum, and ancillary components. The 28-foot-deep pool was drained in phases, dependent upon dose rate levels. NorthStar removed thermal column graphite, several one-ton lead shutter plates, hot cell interferences, and ancillary systems.
All reactor tank and cutting recycle water was containerized, filtered, sampled, and released

## Activated & Contaminated Concrete Removal

Wire saw cutting was used to remove the surface contaminated Hot Cell concrete, the upper portions of the Bioshield, and the lower portions of the Bio-shield to remove activated concrete. Approximately 600 tons of concrete were cut and removed in 10-ton maximum size blocks. The blocks were segregated into 3 different waste streams, dependent upon radioactivity levels. The cutting water was recycled to minimize waste volume.

Following Bioshield removal, a remotely-operated BROKK, equipped with an impact hammer, was used to break and remove the activated concrete from the tank bottom, below the reactor. A containment, portable HEPA ventilation, and a light water mist was used to control dust levels.

## Facility Systems Removal

NorthStar removed the remaining contaminated systems from the building structure, including the primary and secondary coolant piping, drain lines, several large liquid waste tanks, several underground waste storage tanks, radioactive exhaust ventilation systems, hot cell components, and other items.

## Facility Decontamination

The reactor room floor, pipe trenches, tank vaults, and other facility surfaces were decontaminated. NorthStar performed asbestos abatement and hazardous material removal prior to facility demolition.

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## Radiological Waste Transportation and Disposal

NorthStar dispositioned all radiologically contaminated waste as BSFR and LLRW. In addition, NorthStar completed the package, transport, and dispose of the 500 R/hr Class B, mixed low-level radiological waste control blades and the depleted uranium (DU) at the Nevada National Security Site.

## Facility Demolition and Site Restoration

NorthStar demolished and removed the 10,000 square foot footprint structure, foundations, and tank vaults. The building debris was appropriately dispositioned.

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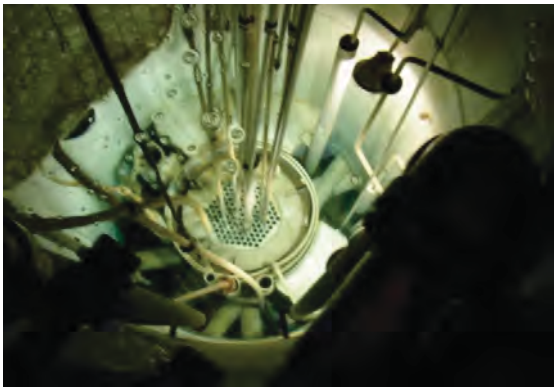
# University of Illinois Nuclear Reactor Lab

| | |
|---|---|
| Client | University of Illinois |
| Location | Urbana, IL |
| Completed | August 2012 |
| NRC | License Number R-115 terminated Jan. 17, 2013 |
| Health & Safety | Zero NRC Violations or OSHA Recordable Injuries |



## Nuclear Reactor Facility Decommissioning

NorthStar was selected to decontaminate and decommission (D&D) the University of Illinois' Mark II reactor and nuclear reactor laboratory. NorthStar dismantled, removed, and packaged the reactor, systems, and structures and decontaminated and removed radiologically contaminated surfaces, components, and debris with unrestricted site release in accordance with 10 CFR 20.

The reactor was placed in "safe storage" mode in 1998, when its 30-year operating license expired. NorthStar was engaged under a prompt DECON appraoch to complete the decommissioning and free release of the site.

### NorthStar's Scope of Work Included:

- NRC License Termination for Unrestricted Site Release
- Radiological Waste Removal and Management
- Reactor Component Removal
- Activated & Contaminated Concrete Removal
- Facility and Auxiliary Systems Removal
- Facility Decontamination & Demolition
- Hazardous Material Abatement

### Radiological Waste Removal and Management

Working within the regulatory framework of the Nuclear Regulatory Commission (NRC) and Environmental Protection Agency (EPA), contaminants were removed inside the facility and included neutron-activated aluminum, steel, concrete, and fission products and laboratory radiological nuclides used in various experiments.

NorthStar's experienced engineering/operations team completed facility and reactor removal prep activities, including stripping the Bioshield exterior surfaces of conduit, piping systems, and interferences. Electrical isolations allowed for removal of process components and electrical distribution components. NorthStar removed the control rod drive mechanisms, irradiation facility drives, control rod guide tubes, irradiation tubing that entered the reactor assembly, fuel racks, reactor instrumentation, reactor tank ancillary items, such as lighting, water cooling piping, emergency spray header, and miscellaneous items that were stored in the tank.

Other facility preparation activities included the sizing and packaging of approximately 1,200 cubic feet of radioactive waste, consisting of glove boxes, debris, graphite stringers from the thermal columns, beam plugs, and miscellaneous laboratory items. The effort cleared a large portion of the floor area to al- low more efficient D&D operations. The reactor tank water was pumped and removed to half height, which provided sufficient shielding for the 40 R/hr reactor assembly, and yet allowed the top half of the Bioshield to be removed.

## Concrete Cutting

The top Bioshield and shield tank were removed by wire saw cutting, and the concrete was radiologically released. Cutting Edge services performed approximately 1,200 square feet of wire saw cuts into 70 blocks. The cutting water was recycled to minimize waste volume.

## Reactor Removal

The reactor components were removed in phases. The rotating rack had a dose rate of 40 R/hr, which measured the charge produced per hour, and was segregated from the reflector. The rotating rack was individually packaged, shielded, and loaded in a cask for shipment to an off-site facility for proper disposal. The tank was completely pumped of all liquids, dependent upon dose rates, prior to reactor assembly removal. The reflector and core support plenum were then disconnected from the cooling loop, 7 beam ports, and bolted connections. The assembly and remaining components were specially-packaged for transportation and disposal.

## Activated Material Removal

A remotely-operated Brokk was equipped with an impact hammer to break and remove the activated concrete and metals in the vicinity of the active core region. A containment, portable HEPA ventilation, and a light water mist was used to control dust levels. As the embedded beam tubes were exposed, they were separated in sections using the Brokk. The shadow shields and activated Bioshield metals were removed with the concrete. Once it was determined that all concrete and steel had been removed that required packaging and disposal as low-level radioactive waste, the remainder of the Bioshield was released in place.

NorthStar removed the remaining potentially-contaminated systems from the building structure, including the primary coolant piping, heat exchanger, and pump, Nitrogen-16 delay tanks, waste-water system, and embedded fuel storage tubes. The reactor room floor,

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pipe tunnel, catch basin, sump and other concrete were decontaminated using scabblers, saw cuts, or impact hammers. Any contaminated soils were removed and packaged. NorthStar also performed asbestos abatement and hazardous material removal prior to facility demolition. Finally, NorthStar demolished and removed the 3,200 square foot structure, foundation, tunnels, and vaults. The released portion of the Bioshield was rubblized during building demolition.

## Final Status Survey and License Termination

The Final Status Survey (FSS) Report was submitted to the NRC on October 9, 2012. Facility Operating License No. R-115 was terminated on January 17, 2013.

"NorthStar's attention to detail and safety created a smooth and efficient work environment that brought the project to completion on-time and on-budget. The crew as a whole had a very harmonious working relationship that made working with them a genuine pleasure. I would not hesitate to recommend your company and crew to others seeking your services."

Rich Holm, Reactor Administrator
University of Illinois

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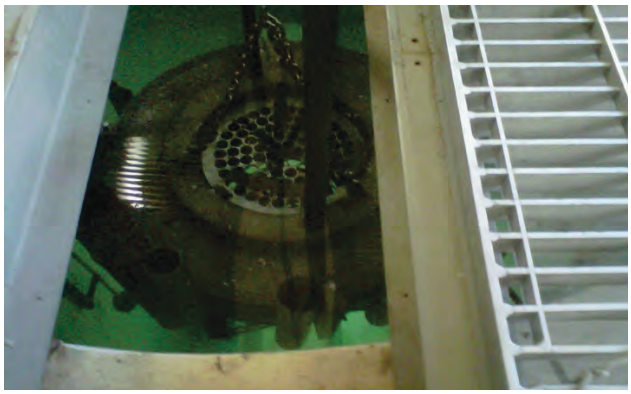
# University of Arizona Nuclear Reactor Lab

| | |
|---|---|
| Client | University of Arizona |
| Location | Tucson, AZ |
| Completed | November 2011 |
| NRC | License Number R-52 terminated Feb. 28, 2012 |
| Health & Safety | Zero NRC Violations or OSHA Recordable Injuries |



## Nuclear Reactor Facility Decommissioning

NorthStar was contracted by the University of Arizona to decontaminate and decommission (D&D) the University's reactor and Nuclear Reactor Laboratory (NRL). NorthStar dismantled the reactor, ancillary support systems, removed all radioactive materials from the NRL, and reduced the radioactivity to levels that permitted release of the licensed area for unrestricted use and License termination. Activities were completed in accordance with 10 CFR 20.

### NorthStar's Scope of Work Included:

- NRC License Termination for Unrestricted Site Release
- Radiological Waste Removal and Management
- Reactor Component Removal
- Activated & Contaminated Concrete Removal
- Facility and Auxiliary Systems Removal
- Facility Decontamination & Demolition
- Hazardous Material Abatement
- Site Restoration

### Final Status Survey and License Termination

The Final Status Survey (FSS) Report was submitted to the NRC on December 1, 2011. Facility Operating License No. R-52 was terminated on February 28, 2012

# University of Washington Nuclear Reactor

| | |
|---|---|
| Client | University of Washington |
| Location | Seattle, WA |
| Completed | November 2006 |
| NRC | License Number R-73 terminated Aug. 29, 2007 |
| Health & Safety | Zero NRC Violations or OSHA Recordable Injuries |

## Nuclear Reactor Facility Decommissioning

NorthStar served as the University of Washington's Decommissioning Operations Contractor (DOC) to decontaminate and decommission (D&D nuclear reactor. NorthStar removed and disposed of all hazardous and radioactive materials above unrestricted release limits to allow the University to terminate its Nuclear Regulatory Commission (NRC) License No. R-73.

The reactor operated for UW's Department of Nuclear Engineering from 1961 to 1988.

### NorthStar's Scope of Work Included:

- NRC License Termination for Unrestricted Site Release
- Radiological Waste Removal and Management
- Reactor Component Removal
- Activated & Contaminated Concrete Removal
- Facility and Auxiliary Systems Removal
- Facility Decontamination & Demolition
- Hazardous Material Abatement

### Safe Approach to D&D Near Occupied Facilities

The NorthStar team faced several challenges, from generating multiple sets of plans and procedures for the job in a short period of time, to dealing with a number of confined space issues and preventing disruption to adjacent occupied University facilities.

The More Hall Annex was situated in the heart of a major university with occupied facilities and buildings surrounding the Annex, including a nearby student union. Most of the work was performed while classes were in session, so the NorthStar team had to be sensitive not only to protecting the health and safety of the work force, but also sensitive to the

protection of the students, faculty and public, as well as the prevention of other adverse impacts to the University and its operations.

## Radiological Waste Removal and Management

Working within the regulatory framework of the Nuclear Regulatory Commission (NRC) and Washington Department of Labor and Industries (DOLI), contaminants were removed inside the facility which included asbestos, lead-based paint, and radiological contaminants from the following radionuclides of concern: Cobalt-60, Europium-152 and -154, Helium-3, Carbon-14, Pluto- nium-239, -240, and -241. Plutonium contamination was present as a result of a plutonium foil failure that occurred during an oscillator experiment in 1972. As a result of this incident, NorthStar had to remove the ventilation system from the reactor building, as well as decontaminate surfaces in and adjacent to the reactor room. An above-ground radiological waste retention tank was also characterized, removed, and disposed.

Other hazardous materials such as lead and cadmium, which were necessary to support the dismantlement of the reactor and other related reactor components and systems, were re-moved. Activated concrete in the heavily reinforced bioshield area and the reactor pedestal were also removed.

Waste management responsibilities included the characterization, transportation and disposal of all hazardous, radioactive and mixed waste generated by project D&D activities. Waste minimization was a primary focus of the project. NorthStar's D&D approach effectively separated the activated concrete and metals from those materials that could be handled as construction debris.

"NorthStar reacted quickly to all challenges and managed the work of subcontractors effectively, making every effort to accommodate the University's requests while accomplishing the project goals. I have found NorthStar to be a first rate contractor that I would highly recommend for future work at the University of Washington or to anyone that needs to have asbestos and hazardous material abatement or D&D work performed in a safe, cost effective and professional manner."

Jeff Angeley, Associate Construction Manager
University of Washington – Capital Projects Office

The project's waste minimization efforts ultimately resulted in a 45% reduction to the anticipated volume of low level radioactive waste (LLRW). A total of 1,700 cubic feet of LLRW was generated and shipped offsite for disposal, as well as 32 cubic feet of mixed waste. Upon completion of D&D activities, a Final Status Survey was performed to verify that the endpoint criteria had been met to satisfy NRC license termination requirements.

## Final Status Survey and License Termination

The Final Status Survey (FSS) Report was submitted to the NRC on October 9, 2012. Facility Operating License No. R-115 was terminated on January 17, 2013

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