In the United States Court of Federal Claims

No. 04-037C

(Filed: June 14, 2011)

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CAROLINA POWER & LIGHT COMPANY, and FLORIDA POWER CORPORATION,	*	
Plaintiffs,	*	Spent Nuclear Fuel Case; Damages Determined on Remand; Use of DOE's 1987 Annual Capacity Report; Mandate Rule; Concepts of Full Core Reserve and Prudent Operating Reserve; Spent Fuel Pool Re-rack Operations.
v.	*	
THE UNITED STATES,	*	
Defendant.	*	
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Brad Fagg, with whom was *David M. Kerr*, Morgan, Lewis & Bockius, LLP, Washington, D.C., for Plaintiffs.

Daniel J. Rabinowitz, with whom were *Tony West*, Assistant Attorney General, *Jeanne E. Davidson*, Director, and *Alan J. Lo Re*, Assistant Director, United States Department of Justice, Civil Division, Commercial Litigation Branch, Washington, D.C., *Jane K. Taylor*, and *Andrew P. Averbach*, Of Counsel, for Defendant.

OPINION AND ORDER

WHEELER, Judge.

This case is before the Court on remand from the United States Court of Appeals for the Federal Circuit. See Carolina Power & Light Co. v. United States, 573 F.3d 1271 (Fed. Cir. 2009). Plaintiffs Carolina Power & Light Company and Florida Power Corporation (collectively "Progress Energy") own five nuclear reactors at four power plants in North Carolina, South Carolina, and Florida. The power plants are known as Harris, Brunswick, Robinson, and Crystal River. Progress Energy incurred substantial costs at these plants because the Department of Energy (DOE) failed to collect and dispose of spent nuclear fuel beginning January 31, 1998 as required under DOE's Standard Contract. Following a November 2007 trial, this Court awarded Progress

Energy $82,782,289 for the costs of mitigating DOE's partial breach. Carolina Power & Light Co. v. United States, 82 Fed. Cl. 23 (2008), amended by 82 Fed. Cl. 317 (2008). Defendant appealed this ruling, contending that the Court had not used the correct spent fuel acceptance rate in calculating Progress Energy's recovery. Although Defendant partially prevailed in having the Federal Circuit clarify the proper acceptance rate to be employed, the result now is that Progress Energy is entitled to a greater recovery than if Defendant had not appealed.

The Standard Contract, executed in 1983, did not contain an express acceptance rate for DOE's expected collection of spent fuel fifteen years later in 1998. See Carolina Power, 82 Fed. Cl. at 37. At trial, Progress Energy used a 2004 DOE Annual Capacity Report (ACR) to calculate damages. Id. at 43. However, the Federal Circuit held that DOE's 1987 ACR should be used instead for this purpose. Carolina Power, 573 F.3d at 1277. The 1987 and 2004 ACRs are quite similar in ultimately reaching an industry acceptance rate of 3,000 metric tons of uranium (MTUs) per year, but the 1987 ACR has a more rapid ramp-up rate in the first two years than the 2004 ACR. Thereafter, the 1987 ACR does not reach 3,000 MTUs per year until the eleventh year of the program, while the 2004 ACR reaches 3,000 MTUs per year in the fifth year.

On remand, Progress Energy has revised its damages model to conform to the 1987 ACR as the Federal Circuit mandated. Essentially, the 1987 ACR ramp-up rate in the early years of DOE's performance yields a higher claim recovery because DOE would have collected more of Progress Energy's spent fuel sooner, and thus more of the costs are DOE's responsibility. Progress Energy also assumed in its revised model that spent fuel could be shared among its plants as authorized by the Standard Contract, and that in using DOE allocations, it would prioritize Robinson spent fuel stored at Harris over Robinson spent fuel stored at Brunswick. Based upon these adjustments, Progress Energy has added $9,168,312 to its claim, bringing the total to $91,957,601. The additional $9,168,312 consists of: (a) $8,038,737 for 27 additional spent fuel shipments between plants that could have been avoided under the 1987 ACR rate; and (b) $1,129,575 associated with the re-rack of the Harris Plant B spent fuel pool that would not have been necessary under the 1987 ACR rate. Of this amount, Defendant concedes liability for $4,168,234, but contests the remainder.

Defendant's objections to the revised claim can be summarized in two categories. First, Defendant asserts that $5,000,078 of Progress Energy's costs are not attributable to the 1987 ACR acceptance rate differences, but to other unrelated changes to Progress Energy's causation model. Second, Defendant states that the new model is flawed because it does not account for Progress Energy's management practice of maintaining "prudent operating reserve" for the storage of spent fuel.

The Court conducted a one-day remand trial on February 16, 2011, and received post-trial briefs from the parties on March 18, 2011 and reply briefs on April 1, 2011.

Based upon the new evidence presented, the Court concludes that Progress Energy is entitled to additional damages of $9,168,312. Defendant's objections to Progress Energy's additional damages, discussed below, are without merit. Progress Energy's total recovery therefore is $91,957,601.

Background

The following information from the Court's first decision and subsequent history is relevant to the damages issues presented on remand. A more complete analysis of the entire case is available by referring directly to that decision. Carolina Power, 82 Fed. Cl. 23.

A. The Standard Contract

DOE's Standard Contract resulted from Congress's passage of the Nuclear Waste Policy Act of 1982 (NWPA), Pub. L. No. 97-425, 96 Stat. 2201 (codified at 42 U.S.C. §§ 10101-10270). Carolina Power, 82 Fed. Cl. at 28-29. In the NWPA, Congress directed the Secretary of DOE to "enter into contracts with any person who generates or holds title to high-level radioactive waste, or spent nuclear fuel, of domestic origin for the acceptance of title, subsequent transportation, and disposal of such waste or spent nuclear fuel." § 10222(a)(1); Carolina Power. 82 Fed. Cl. 28-29. DOE published the proposed Standard Contract in the Federal Register on February 4, 1983. Id. at 29. Nuclear plant owners and operators had no choice but to enter into the Standard Contract with DOE. Id.

The Standard Contract required DOE to accept title to all spent nuclear fuel beginning January 31, 1998. Id. The Standard Contract also required DOE to issue an ACR, beginning not later than July 1, 1987. Id. The ACR would project DOE's annual spent fuel receiving capacity for the ten years "following the projected commencement of operation of the initial DOE facility." Id. DOE was required to issue an annual priority ranking (APR) beginning April 1, 1991, to identify the order in which spent fuel and high level waste would be collected, with the older fuel or waste being collected first. Id. The utilities were then required to prepare a delivery commitment schedule which identified the spent nuclear fuel that the utility would deliver to DOE 63 months thereafter. Id.

By 1987, DOE knew that it would not have a functioning permanent repository to begin accepting spent fuel on January 31, 1998. Id. at 32. DOE submitted a proposal to Congress to build a Federal Interim Storage or Monitored Retrievable Storage (MRS) facility. Id. Congress amended the NWPA to allow the new storage facility, but limited the MRS capacity to 10,000 MTUs and stated that MRS construction could not begin until a license was issued for construction of a permanent facility. Id. at 32-33; 42 U.S.C. §§ 10162(b), 10168(d)(1), (3). In June 1987, DOE published its first statutorily required ACR. Carolina Power, 82 Fed. Cl. at 33. The 1987 ACR adopted the following industry-

wide acceptance schedule: 1,200 MTUs for 1998-2002, 2,000 MTUs in 2003, 2,650 MTUs for 2004-2007, and 3,000 MTUs annually thereafter. Id. In 1991, DOE published its first official APR setting the order of fuel acceptance at individual nuclear plants with an objective of collecting the oldest fuel first. Id. DOE also published a new ACR in 1991. Id. The 1991 ACR projected an acceptance rate of 400 MTUs in 1998, 600 MTUs in 1999, and 900 MTUs annually during 2000-2007. Id. The 1991 ACR was based on the assumption that there would be an interim MRS facility with a 10,000 MTU capacity. Id. In 2004, DOE published another ACR, based on the assumption that a repository would be operational in Yucca Mountain, Nevada beginning in 2010. Id. Under the 2004 ACR, DOE would accept 400 MTUs in 2010, 600 MTUs in 2011, 1,200 MTUs in 2012, 2,000 MTUs in 2013, and 3,000 MTUs annually thereafter. Id. at 43.

The Court explained in the first opinion that "Plaintiffs bear the burden of proving that DOE's partial breach was a substantial causal factor of each claimed mitigation cost." Id. at 41. To meet this burden, Progress Energy created a causation model showing the spent fuel management actions that Plaintiffs did take in the real world and those actions that Plaintiffs would have taken if DOE had performed under the 2004 ACR/APR beginning in 1998. Id. at 43. Progress Energy also created a second model, at the request of Defendant, showing the actions that Plaintiffs would have taken if DOE had performed under the 1991 ACR. Id. The Court found that 3,000 MTUs per year, the acceptance rate reached under both the 1987 and 2004 ACRs, was the proper standard for measuring the steps DOE should have taken and intended to take in performing the Standard Contract. Id. at 39. The Court, therefore, used Progress Energy's causation model based upon the 2004 ACR as the benchmark for awarding damages. Id. at 44.

The Court issued its decision on May 19, 2008, awarding Plaintiffs $82,845,926. Id. at 27. Upon review of Defendant's motion for reconsideration, the Court slightly reduced the award on June 19, 2008 to $82,789,289. Carolina Power, 82 Fed. Cl. at 318.

B. Federal Circuit Decisions Regarding DOE's Acceptance Rate

On August 7, 2008, nearly three months after this Court issued the Carolina Power decision, the Federal Circuit decided Pacific Gas & Electric Co. v. United States, 536 F.3d 1282 (Fed. Cir. 2008). The Federal Circuit found in Pacific Gas that, when relying on post-formation conduct to interpret a contract, the most accurate picture of the parties' intent is when both parties expected full performance. Id. at 1290-91. The 1991 ACR relied upon by the trial court in Pacific Gas did not reflect the parties' intent because it came after the 1987 NWPA Amendments which prohibited construction of an MRS facility without a license for a permanent facility, a requirement that made DOE's breach virtually inevitable. Id. at 1291. Instead, the Federal Circuit decided that the 1987 ACR, which DOE published before the 1987 NWPA Amendments, was the best available pre-breach evidence of the parties' intent for an acceptance rate. Id. at 1291-92. In Pacific Gas, the Federal Circuit remanded with instructions to calculate damages based upon the

1987 ACR. Id. at 1292. The Federal Circuit issued two other spent nuclear fuel decisions on August 7, 2008 reaching the same result. Yankee Atomic Electric Co. v. United States, 536 F.3d 1268 (Fed. Cir. 2008); Sacramento Mun. Util. Dist. v. United States, 293 F.App'x 766 (Fed. Cir. 2008).

On July 21, 2009, the Federal Circuit in this case affirmed in part and vacated in part. Carolina Power, 573 F.3d 1271. Following the reasoning in Pacific Gas, the Federal Circuit vacated the damages award because this Court had relied on the 2004 ACR rate, and remanded for a recalculation of damages based on the 1987 ACR. Id. at 1275. Defendant moved for rehearing en banc at the Federal Circuit, which was denied on November 3, 2009. The Federal Circuit issued its mandate on November 10, 2009.

C. The Differences Between the 1987 and 2004 ACRs

The differences between the 1987 ACR chosen by the Federal Circuit, and the 2004 ACR adopted in this Court's first Carolina Power decision are relatively modest, but they nevertheless affect the calculation of Progress Energy's damages. While DOE's 2004 ACR was intended to begin in 2010, a comparison of the 1987 and 2004 ACRs can be made by assuming that both of them would have begun in January 1998. After making this assumption, the chart below provides a year-by-year comparison.

Year	2004 ACR Rate	Cumulative Total MTU under 2004 ACR Rate	1987 ACR Rate	Cumulative Total MTU under 1987 ACR Rate
1998	400	400	1,200	1,200
1999	600	1,000	1,200	2,400
2000	1,200	2,200	1,200	3,600
2001	2,000	4,200	1,200	4,800
2002	3,000	7,200	1,200	6,000
2003	3,000	10,200	2,000	8,000
2004	3,000	13,200	2,650	10,650
2005	3,000	16,200	2,650	13,300
2006	3,000	19,200	2,650	15,950
2007	3,000	22,200	2,650	18,600
2008	3,000	25,200	3,000	21,600
2009	3,000	28,200	3,000	24,600
2010	3,000	31,200	3,000	27,600

The 1987 and 2004 ACRs both reach an acceptance rate of 3,000 MTUs per year, but the 2004 ACR reaches that level in the fifth year while the 1987 ACR reaches it in the eleventh year. The ramp-up is faster for the first two years under the 1987 rate, but then

is surpassed by the 2004 ACR in the fourth year. Under the 1987 ACR rate, in the first four years, DOE would have picked up more spent fuel from the industry, including Progress Energy.

D. Plaintiffs' Recalculated Damages and Proceedings on Remand

Following remand to this Court, the parties initially attempted to resolve the damages issues voluntarily. On September 30, 2010, Progress Energy produced to Defendant a supplemental disclosure of additional damages, and later filed the recalculated damages with the Court. Progress Energy attached to its recalculated damages the causation model used in the first trial (the 2004 ACR model), and a new causation model using the 1987 ACR acceptance rate (the 1987 ACR model).

In the recalculated damages, Plaintiffs disclosed two changes under the 1987 ACR that caused an increase in damages. First, there were shipments from the Brunswick and Robinson plants to the Harris plant that were necessary under the 2004 ACR causation model, but are unnecessary under the 1987 ACR causation model. (Disclosure of Recalculated Damages 7.) Progress Energy identified 27 additional shipments that could have been avoided under the 1987 ACR model. Id. at 8. At $297,731 per shipment, the total claimed for 27 shipments is $8,038,737. (Errata 1.) Second, under the 2004 ACR model, Progress Energy determined that if DOE had performed, it would not have activated the Harris Plant C & D spent fuel pools, but would have instituted re-rack operations on the existing Harris Plant B pool and credited the Government that amount. Under the 1987 ACR model, Progress Energy has determined that if DOE had performed, it could have avoided activating the Harris Plant C & D spent fuel pools and the Harris Plant B re-rack operation. (Disclosure of Recalculated Damages 9.) Progress Energy claims an additional $1,129,575 in damages, representing the amount that was deducted for the re-rack operation under the 2004 model. Id. at 10.

The Court granted Defendant a brief discovery period to explore the bases for Progress Energy's supplemental calculations. (Government Statement, Nov. 19, 2010; Pretrial Order, Dec. 2, 2010.) At the February 16, 2011 remand trial, two witnesses testified, Stephen Edwards, the current manager for dry fuel services at Progress Energy and Robert Kunita, a retired engineer and supervisor at Progress Energy.

Findings of Fact on Remand[1]

A. Plaintiffs' 1987 ACR Causation Model

As a result of the Federal Circuit's decision, Progress Energy created a third causation model using the 1987 ACR, and then analyzed how the new model affected Progress Energy's damages. (Edwards, Tr. 55-56.)[2] Under Mr. Edwards' supervision, Progress Energy created the third causation model using the same process it had used for the 2004 and 1991 ACR models in the first trial. (Edwards, Tr. 56-57.) To develop the model, Progress Energy relied on historical and planning documents, inventory records, plant records, the nuclear material database, projections from the core design organization, and shipping records. (Edwards, Tr. 56.) Mr. Edwards explained how he and his staff created the model:

> We started with an Excel spreadsheet, had the historical information on space available in the different pools, discharge record, inventory records, shipping records, et cetera; reviewed that information, then taking the 1987 ACR information, then inserted those, determined what our allocations on an annual basis by plant would be; inserted that into the model, and then went through the similar iterative process for how we might utilize those allocations, given the other constraints and opportunities that we had within the model, and come up with an approach for how we could maintain a full core reserve in all of the pools.

(Edwards, Tr. 57.)

To determine the available DOE acceptance allocations, Progress Energy first reviewed the June 1987 ACR. (Edwards, Tr. 60; PX 38.) For the years 1998-2007, this report provided the DOE industry acceptance rate by year expressed in MTUs. (Edwards, Tr. 60-61; PX 38 at 7.) For the years after 2007, Progress Energy relied upon the June 1987 Office of Civilian Radioactive Waste Management mission plan amendment. (Edwards, Tr. 61-62; DX 59 App. F at 61.) To determine where Progress Energy would fall in the priority ranking of spent nuclear fuel to be collected by DOE, the company relied upon the 2004 APR. (Edwards, Tr. 62.) Progress Energy decided to use the 2004 APR rather than one of the earlier priority rankings because the 2004 APR

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

[2] In this opinion, the Court will refer to the parties' stipulations of fact from the first trial, filed on October 19, 2007, as "Stip. ¶ __." The trial transcript will be referred to by witness and page as "Name, Tr. __," and trial exhibits will be referenced "PX __" for Plaintiffs' exhibits, and "DX __" for Defendant's exhibits.

contained additional years of historical discharge data.[3] (Edwards, Tr. 62-63.) The 2004 APR provides the priority ranking for DOE acceptance. (Edwards, Tr. 64; PX 128 App. A.) This document also contains a column showing the cumulative total of MTUs discharged. Id. Based upon the amount to be accepted each year under the 1987 ACR, Progress Energy could determine the spent fuel allocation amounts for each of its plants in a given year. Id.

Progress Energy's causation models provided a year-end snapshot of the capacity in the spent fuel storage facilities. (Edwards, Tr. 34-35, 66; PX 167.) For each plant, the data shows the number of open spaces in the spent fuel pool at the start of the year, the number of open spaces in the pool at the end of the year, and whether Progress Energy has maintained full core reserve at the end of the year. (Edwards, Tr. 28-33, 66-69; PX 137; PX 167.) A column for Robinson Unit 2, for example, entitled "End Open FCR = 157," compares the number of open spaces at Robinson Unit 2 at year end with a full core reserve quantity of 157 spaces. Id. "Full core reserve" refers to Progress Energy's objective of maintaining enough open space in spent fuel pools to allow Progress Energy to discharge all of the nuclear fuel in the reactors into the spent fuel pool if necessary. (Edwards, Tr. 24.) The goal of the models was to develop a scenario in which Progress Energy could maintain full core reserve while utilizing the allocations from DOE as well as additional space from the company's shipping program and other activities. (Edwards, Tr. 33, 69.)

Comparing the new causation model to the original 2004 ACR model, Mr. Edwards determined that:

> [M]ost of the activities were the same. We still did not have to do onsite dry storage at Brunswick. We still did not have to do the second onsite dry storage facility at Robinson. We did not have to activate Charley and Delta spent fuel pools at Harris. We did not have to do a number of spent fuel shipments. And in fact, there were some additional spent fuel shipments. I think it was 27, based on comparing this model to the [2004 ACR] model that we would not have had to perform in comparing those. And then the hypothetical re-rack that we had included during the original lawsuit was not required in this particular model.

(Edwards, Tr. 72-73.)

[3] As discussed above, DOE published the first APR based on discharge data in 1991. The 1987 ACR also had discharge data but it was limited. The 2004 APR extends the actual discharge data provided in 1991. Pacific Gas & Electric Co. v. United States, 92 Fed. Cl. 175, 185 n.7 (2010). Because it had additional discharge data, the Court in Pacific Gas found it reasonable to apply the 1987 ACR to the 2004 APR to determine allocations. Id. This Court agrees.

B. The 27 Spent Fuel Shipments

Progress Energy employed a spent fuel shipping program to manage spent fuel storage among its plants. (Edwards, Tr. 23.) Progress Energy's practice was to ship spent fuel from a plant with less space to a plant with more space. Id. For example, between 1977 and 1981, Progress Energy shipped spent fuel from the Robinson plant to the Brunswick plant. Id. Beginning in 1989, after the Harris plant opened, Progress Energy shipped spent fuel from both Robinson and Brunswick 1 and 2 to Harris. (Edwards, Tr. 23-24.)

To determine how many shipments were caused by DOE's partial breach, Mr. Edwards and his staff first reviewed shipment reports and other company data. (Edwards, Tr. 82.) They then compared this data to the 1987 ACR causation model. (Edwards, Tr. 83.) For example, in 1997, Progress Energy made one shipment from Brunswick Unit 1 to the Harris plant. Id. However, in the 1987 ACR causation model for Brunswick 1, no shipments were necessary. (Edwards, Tr. 83; PX 167.) Therefore, one shipment was added to the damages claim for 1997. (Edwards, Tr. 83.) Using this process, there were 27 shipments avoided under the 1987 ACR causation model, in addition to 56 shipments previously included under the 2004 ACR causation model. (Edwards, Tr. 84-85.) The average cost per shipment was $297,731. (Edwards, Tr. 74.) For 27 shipments, Progress Energy's total additional claim is $8,038,737. (Edwards, Tr. 75.)

Thirteen of the shipments that were added to damages under the 1987 ACR model are attributable to Progress Energy sharing allocations among its plants as allowed by the Standard Contract. (Edwards, Tr. 97; PX 168.) Sharing allocations of spent fuel allows a utility to use a DOE allocation for one plant's spent fuel and employ it instead for another plant. (Edwards, Tr. 43, 94-95.) Plaintiff Carolina Power held one Standard Contract for the Robinson plant, Brunswick Units 1 and 2, and the Harris plant. (Edwards, Tr. 43.) For example, in sharing allocations, Carolina Power could use a Robinson plant allocation to remove Brunswick's spent fuel. (Edwards, Tr. 94-95.) The Standard Contract expressly allows utilities to share allocations, stating that "Purchaser shall have the right to determine which [spent nuclear fuel] is delivered to DOE." (Edwards, Tr. 43-44; PX 10 at 12.)

Mr. Edwards and his staff understood that plants were permitted to share spent fuel allocations in preparing the original 2004 ACR model. (Edwards, Tr. 45.) Progress Energy did not include a sharing factor in preparing the 2004 ACR model because it was complex and Progress Energy wanted to simplify the model. (Edwards, Tr. 46.) However, Progress Energy did include sharing for the 1991 ACR model prepared at the request of Defendant because it was not as concerned about keeping the model simple. (Edwards, Tr. 46-47.) Had Progress Energy used the sharing of allocations in the 2004

ACR causation model, it could have avoided an additional eight shipments and added $2,333,848 to its claim. (Edwards, Tr. 96; PX 168.)

C. Harris Plant B Re-Rack

For the Harris Plant B re-rack operation, Mr. Edwards explained that when he developed the original causation model, Progress Energy would have needed a small amount of additional spent fuel storage space at the Harris plant. (Edwards, Tr. 75.) The additional space was not large enough to justify activation of the Harris Plant C & D spent fuel pools, but was large enough that Progress Energy would have re-racked the Harris Plant B pool. Id. Thus, in the first trial, Progress Energy deducted the amount it would have cost to re-rack the Harris B pool from its total damages. (Edwards, Tr. 76.) When Progress Energy performed its analysis under the 1987 ACR causation model, it determined that the Harris B pool re-rack operation would not have been necessary and it no longer afforded this credit to Defendant. (Edwards, Tr. 76-77.) The deduction amounted to $1,129,575. Id.

Under the 2004 ACR model, Progress Energy used its Robinson allocations to remove Robinson fuel that had been shipped to Brunswick. (Edwards, Tr. 89-90.) In the 1987 ACR model, Progress Energy instead used the DOE allocations to remove the Robinson fuel at Harris first. Id. Mr. Edwards explained that there was no operational reason to have made the assumption in the 2004 ACR model that Robinson fuel would be removed from Brunswick before Harris. (Edwards, Tr. 90.) In actual performance, Robinson fuel still is stored at Brunswick. Id. Progress Energy could have also avoided the hypothetical re-rack under the 2004 ACR model if it had used Robinson plant allocations to pick up Robinson fuel at Harris rather than using those allocations to pick up Robinson fuel at Brunswick. (Edwards, Tr. 89.)

D. Prudent Operating Reserve

At Progress Energy, "prudent operating reserve" is defined as full core reserve plus the next batch of fuel assemblies that will be loaded into the reactor. (Edwards, Tr. 26.) This management tool allows for new fuel in the spent fuel pool just before a refueling outage while still maintaining full core reserve. (Kunita, Tr. 158.) The only way of assuring that full core reserve exists immediately after a refueling outage is to require prudent operating reserve just before the outage. Id. Requiring prudent operating reserve before an outage is a means of assuring that a plant maintains full core reserve at all times. (Edwards, Tr. 27.) The goals of achieving full core reserve and prudent operating reserve simply are for the purpose of managing spent fuel at Progress Energy, and do not stem from any governmental regulatory requirement. (Edwards, Tr. 24, 26.) At Progress Energy, the nuclear plants typically refuel on either eighteen-month or two-year cycles. Carolina Power, 82 Fed. Cl. at 34.

Progress Energy's spent fuel management plans reflect an objective of maintaining prudent operating reserve just before a refueling outage as a means of maintaining full core reserve. (Kunita, Tr. 161-67.) If Progress Energy scheduled an outage early in a year, Progress Energy would attempt to complete all shipments necessary to obtain prudent operating reserve prior to the end of the previous calendar year. (Kunita, Tr. 171.) Progress Energy used this plan partly to avoid the weather risks of making shipments in January and February. (Kunita, Tr. 170-71.) Progress Energy often achieved its goal of prudent operating reserve, but at times it did not. (Kunita, Tr. 178.) The critical point for achieving prudent operating reserve was just before a refueling outage. Id.

The loss of prudent operating reserve in any year meant that Progress Energy could not assure storage of new fuel in the spent fuel pool and still maintain full core reserve. (Edwards, Tr. 130.) Progress Energy has always presumed that it could work cooperatively with DOE in arranging spent fuel acceptance schedules, and reach appropriate decisions regarding fuel outages and spent fuel management. (Edwards, Tr. 36-38.) The whole process under the Standard Contract and the NWPA was to establish spent fuel acceptance schedules that were acceptable to all parties. (Edwards, Tr. 37.) The five-year lead time before acceptance gave DOE and the utilities ample opportunity to develop a reasonable schedule that would allow Progress Energy to maintain full core reserve. (Edwards, Tr. 38.) If Progress Energy could not maintain full core reserve during any year, it would evaluate the risk of dropping below full core reserve for a brief period. Id. Historically, both Brunswick units and the Robinson plant occasionally have dropped below full core reserve. (Edwards, Tr. 39.) Robinson was operating below full core reserve at the time of trial. Id.

Discussion

A. Plaintiffs' Changes to the Causation Model Are Permissible.

Defendant is critical of Progress Energy's recalculated damages because it alters the depiction of the non-breach world in a manner that is unrelated simply to applying the 1987 ACR rate instead of the 2004 ACR rate. (Def.'s Post-Trial Br. 4.) First, the depiction of the non-breach world in the 2004 ACR model assumed no sharing of allocations while the 1987 model does share allocations. Id. at 4. Thirteen shipments, amounting to $3,870,503 of the claimed damages, are attributable to the sharing of allocations in the 1987 ACR causation model. (Def.'s Post-Trial Br. 5; Edwards, Tr. 97-98; PX 168 n.1.) Second, in the 2004 ACR model, Progress Energy transfers to DOE all Robinson spent fuel that was stored at Brunswick Units 1 and 2 before the Robinson fuel that was stored at Harris, while in the current model the Robinson fuel at Brunswick remains there and the Robinson fuel at Harris is transferred earlier. (Def.'s Post-Trial Br. 6.) The reversal of the Harris re-rack deduction, amounting to $1,129,575 in damages, is attributable to a change in the priority of spent fuel. (Def.'s Post-Trial Br. 6; PX 168 at

3.) Defendant essentially maintains that the Federal Circuit's mandate required Progress Energy to create an identical causation model from the first trial that merely applied the 1987 ACR rate.

Cases before this Court on remand are governed by the mandate rule. Every appellate court judgment vests jurisdiction in the trial court to carry out some further proceedings. Exxon Chem. Patents, Inc. v. Lubrizol Corp., 137 F.3d 1475, 1483 (Fed. Cir. 1998). In some cases, those proceedings may be purely ministerial, but frequently, the proceedings are more extensive. Id. Mandates should be interpreted by looking at the language of the judgment in combination with the accompanying opinion. Id. The trial court is free to take any action that is consistent with the appellate mandate. Id. at 1484. The trial court cannot give relief beyond the scope of the mandate, but it may act on any issue left open by the mandate. Pacific Gas, 92 Fed. Cl. at 183. The interpretation of a mandate is a question of law, reviewable de novo. Laitram Corp. v. NEC Corp., 115 F.3d 947, 950-51 (Fed. Cir. 1997). "The trial court must therefore do its best to interpret the appellate mandate and conduct remand proceedings consistent with the appellate mandate, while recognizing that the appellate court may reach a different interpretation of its own mandate on appeal." Pacific Gas, 92 Fed. Cl. at 183.

The Federal Circuit's mandate in this case states as follows: "In the instant case, because the trial court improperly relied on the 2004 ACR process for calculating damages, this court remands for a determination of damages based on the proper ACS – the 1987 schedule identified in Pacific Gas as the appropriate measuring stick for determining the parties' contractual intent." Carolina Power, 573 F.3d at 1275.

The Court used the 2004 ACR process in the first trial to determine which damages were substantially caused by the breach. Relying on the 2004 ACR rate to determine how much nuclear fuel would be accepted from its reactors each year, Progress Energy created a causation model representing the spent fuel management actions it would have taken had DOE performed. Using this method, Progress Energy could isolate which projects it undertook because of the breach. For each disputed mitigation cost, the Court determined if it was caused by DOE's partial breach or if Progress Energy likely would have incurred the costs in the absence of the breach.

The Federal Circuit endorsed this method of determining damages in Yankee Atomic Electric Co., 536 F.3d 1268. In that case, decided the same day as Pacific Gas, the Federal Circuit held that this Court had erred in not requiring the plaintiffs "to prove the contractual acceptance rate and apply that rate before suggesting that the Government's breach was a substantial factor in causing the [plaintiffs'] claimed expenses." Id. at 1273. The Federal Circuit stated that this Court must look to record evidence of the plaintiffs' condition with full Government performance so that the Court could perform a comparison between the breach and non-breach worlds. Id. The Federal

Circuit remanded the case so that this Court would use the 1987 ACR embraced in Pacific Gas to assess causation. Id. at 1274.

Under Yankee Atomic and its progeny, a plaintiff must offer a hypothetical model, a "plausible 'but for' world," showing what its costs would have been absent DOE's partial breach. Energy Northwest v. United States, No. 2010-5112, 2011 WL 1312306, at *4 (Fed. Cir. Apr. 7, 2011) ("[A] plaintiff seeking damages must submit a hypothetical model establishing what its costs would have been in the absence of breach."); S. Nuclear Operating Co. v. United States, 637 F.3d 1297, 1304 (Fed. Cir. 2011) ("[B]ecause plaintiffs are seeking expectancy damages, it is incumbent upon them to establish a plausible 'but for' world."). The hypothetical model must be achievable. See Kansas Gas & Electric Co. v. United States, 95 Fed. Cl. 257, 277 (2010) ("[P]lausibility requires an assessment of the evidence that would establish attainability of the 'but for' model"); Bluebonnet Sav. Bank FSB v. United States, 67 Fed. Cl. 231, 238 (2005) (stating that the "but for" world must be achievable and realistic), aff'd, 446 F.3d 1349 (Fed. Cir. 2006); Citizens Fin. Servs. FSB v. United States, 64 Fed. Cl. 498, 513 (2005) (rejecting a model for determining damages when it was based upon unsupported assumptions and did not comport with basic economic principles).

The mandate to this Court thus is to use the same method it used in the first trial to analyze whether the breach was a substantial factor in the causation of the claimed damages. Progress Energy created a model to establish what spent fuel management steps it would have taken in the absence of DOE's breach. Relying on the model, Progress Energy then isolated the real world activities created by the breach. The Court examined the real world activities to determine if they were in fact caused by the breach. The only difference on remand is that Progress Energy, in creating a model, had to show what steps it would have taken if DOE performed under the 1987 ACR instead of the 2004 ACR. In this process, Progress Energy found that if DOE performed under the 1987 ACR, it would have taken the same steps established in the first trial, and it would have avoided an additional 27 shipments and the hypothetical Harris re-rack. (Disclosure of Recalculated Damages 5-10.) Unlike in the first trial, however, Defendant does not argue that these costs would have been incurred even in the absence of the breach. Instead, Defendant criticizes Progress Energy for making changes to the causation model unrelated to the change in the ACR rate.

In the Court's view, Defendant's criticism of Progress Energy's model misconstrues the mandate. The Federal Circuit's mandate does not call for a mere mechanical application of the 1987 ACR to the findings from the first trial. The mandate requires the Court to make a new determination, based on actions Plaintiffs would have taken had DOE performed under the 1987 rate, of whether Progress Energy's mitigation costs were caused by DOE's breach. The mandate thus requires Progress Energy to establish a new plausible "but for" world using the 1987 ACR. While Progress Energy could have created a new "but for" world based on precisely the same assumptions as the

2004 ACR model, the Court does not find that the new "but for" world must be precisely like the one it created for the 2004 ACR model. The limit on the "but for" world is the same as it was in the first trial, that it must be plausible. In this case, there is nothing unrealistic or unattainable about the "but for" world that Progress Energy has created in the model. The Standard Contract allowed for the sharing of allocations. Furthermore, there is nothing implausible about taking Robinson fuel from Harris before Robinson fuel from Brunswick. The Court therefore finds that Progress Energy created a plausible "but for" world on which to base its damages. The change in assumptions alone will not cause the Court to reject Progress Energy's model.

B. The Causation Model Must Reflect Full Core Reserve, Not Prudent Operating Reserve.

Defendant presents a second reason why the Court should reject Progress Energy's model. Defendant argues that Progress Energy's 1987 ACR causation model is flawed because it does not reflect Progress Energy's management practice of attempting to maintain prudent operating reserve. (Def.'s Post-Trial Br. 2-3.) According to Defendant, the 2004 ACR model correctly reflected prudent operating reserve but the current model does not. Id. at 9-11. Defendant asserts that the Court, therefore, should use the operating assumptions regarding the sharing of allocations from Progress Energy's 2004 ACR model and reduce Plaintiffs' damages by $3,870,503. (Def.'s Post-Trial Reply Br. 3.)

In creating both models, Progress Energy demonstrated the steps it would have taken in a non-breach world to meet its goal of maintaining full core reserve at each plant. Defendant's argument would have Progress Energy create a model that reflects the steps it would have taken to maintain prudent operating reserve in the years before refueling outages and full core reserve in other years.[4] With its argument, Defendant would have the Court apply in this case a new, more stringent standard by which to evaluate damages, maintenance of prudent operating reserve in the years before an outage. However, the parties stipulated to the standard of full core reserve in the first trial. (Stip. ¶ 4) ("Plaintiffs' base their spent fuel management plans upon the need to maintain full core reserve at each plant"). The Court accepted this standard in the first

[4] Defendant states broadly in its briefs that the model must reflect prudent operating reserve. However, reviewing its argument more carefully, Defendant actually is only criticizing the model for not maintaining prudent operating reserve in the years prior to the refueling outage. For example, in comparing the two models, Defendant states that the 2004 ACR model maintained with one exception prudent operating reserve throughout the claim period. (Def.'s Post-Trial Br. 9.) This is not correct. In the 2004 ACR model, Brunswick 1 loses prudent operating reserve in 1998 and 2000. Brunswick 2 loses prudent operating reserve 1999, 2000, 2001, and 2003. (PX 137.) Thus, Defendant must mean that the first model with one exception maintained prudent operating reserve in the years before a refueling outage. Defendant apparently would have the Court require Plaintiffs to create a model that reflected prudent operating reserve in the years prior to a refueling outage and full core reserve in other years. Such an approach is unwarranted.

trial. Carolina Power, 82 Fed. Cl. at 44 ("[T]he Court concludes that DOE's partial breach caused Progress Energy to incur claimed costs as part of its effort to maintain full core reserve and avoid a power plant shutdown.")

Further, full core reserve is a standard objective in the nuclear industry. Many cases have calculated damages based upon the maintenance of full core reserve, not the more restrictive prudent operating reserve. Yankee Atomic Electric Co., 536 F.3d at 1274-77 (finding pre-breach re-racking in order to maintain full core reserve reasonable and foreseeable and stating that "though the nuclear regulatory commission (NRC) does not require utilities to maintain such a 'full core reserve,' it encourages them to do so."); S. Cal. Edison Co v. United States, 93 Fed. Cl. 337, 348-49 (2010) (determining damages caused by DOE's breach based on plaintiffs need to maintain full core reserve); Kansas Gas & Electric Co., 95 Fed. Cl. at 278-283 (examining the plaintiff's "but for" world in light of whether Plaintiffs would maintain full core reserve in "but for" world because maintaining full core reserve is prudent); Entergy Nuclear Vermont Yankee v. United States, 95 Fed. Cl. 160, 172 (2010) ("DOE's breach of the 1998 Standard Contract impacted the VYNPS's ability to maintain full core reserve."); Yankee Atomic Power Co. v. United States, 94 Fed. Cl. 678, 712 (2010) (stating that "historically, Maine Yankee maintained [full core reserve]" and analyzing damages for re-rack based on utility's ability to maintain full core reserve and willingness to drop below it for a short period of time); Ariz. Pub. Serv. Co. v. United States, 93 Fed. Cl. 384, 398 (2010) (calculating damages based on steps the plaintiff would have taken to maintain full core reserve if there had been no breach); Dominion Res., Inc. v. United States, 84 Fed. Cl. 259, 268, 271-73 (2008) (analyzing plaintiffs damages based on their need to maintain full core reserve and explaining that "maintaining [full core reserve] is both a prudent operating and management practice in the industry"), aff'd, No. 2009-5031, 2011 WL 1532145 (Fed. Cir. 2011). The Court has not identified a single case, and Defendant has not cited one, that used the prudent operating reserve standard rather than the full core reserve standard for determining damages in spent nuclear fuel cases. Defendant urges the Court to reject a causation model that is in line with the standard adopted in many decisions of this Court. The Court is unwilling to adopt a different standard for this case.

Conclusion

Based upon the foregoing, the Court awards damages to Plaintiffs of $91,957,601 through December 31, 2005, consisting of $82,789,289 awarded by this Court in the first trial, and an additional $9,168,312 awarded on remand. The clerk is directed to enter judgment for Plaintiffs in the amount of $91,957,601. Pursuant to Rule 54, costs are awarded to Plaintiffs.

IT IS SO ORDERED.

s/ Thomas C. Wheeler
THOMAS C. WHEELER
Judge