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Electricity Market Module
Electricity Finance and Pricing
Submodule

Updates for *AEO 1996*

June 1996

Energy Information Administration
Office of Integrated Analysis and Forecasting
U.S. Department of Energy
Washington, DC 20585

MASTER

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1.0 Introduction

The purpose of this report is to document the updates to the Electricity Financial Pricing Module (EFP) to reflect the rate impacts of nuclear decommissioning. The EFP is part of the National Energy Modeling System (NEMS). The updates to the EFP related to nuclear decommissioning include both changes to the underlying data base and the methodology.

Nuclear decommissioning refers to the activities performed to take a nuclear plant permanently out of service. The costs of nuclear decommissioning are substantial and uncertain. The recovery of these costs from ratepayers is to occur over the operating life of the nuclear plant. Utilities are obligated to make estimates of the nuclear decommissioning cost every few years. Given this estimate, utilities are to assess a charge upon ratepayers, such that over the operating life of the plant they collect sufficient funds to pay for the decommissioning. However, cost estimates for decommissioning have been increasing and it appears that utilities have not been collecting adequate funds to date. In addition, there is a real risk that many nuclear plants may be closed earlier than originally planned, further exacerbating the under collection problem. The updates performed in this project provide the EFP with the capability to analyze these issues.

The remainder of this document is divided into two discussions: (i) Nuclear Decommissioning Data Base, and (ii) Methodology. Appendix A contains the actual data base developed during the project.

2. Nuclear Decommissioning Data Base

The sources for the data base shown in Appendix A were: (i) SAIC report on nuclear decommissioning cost estimates and actual fund collection prepared for EIA¹⁾, and (ii) FERC Form 1. The data required for each nuclear plant consists of eleven fields defined in Table 1. Each data record describes a nuclear unit or a plant containing more than one unit (only if unit parameters are similar and utility-owner did not specify data by unit). The database is input into NEMS in the so-called *phasein* input data file.

1) "Defueling, Spent Fuel Storage, and Decommissioning Cost Estimates", Science Application International Corporation, May 11, 1995, Submitted to Energy Information Administration under Contract No. DE-AC01-92EI21944, Task 95155.

Table 1
Fields in the Nuclear Unit Database

Parameter Meaning	Notes and comments	Variable Name
Unit Capacity.	Expressed in MW.	NUCAP
Private ownership share.	The share is calculated as: (private ownership share) / (private + public)	NUPPR
Estimated decommissioning cost.	Expressed in nominal dollars of the year of the estimate.	NDEST
Year of the estimate.		NDESTY
Collected fund(s) balance.	<p>(i) This value is the total balance of all external funds collected as of the year input as NDCBALY (see below).</p> <p>(ii) -1 means that the balance is not known. In this case, the unknown balance for unit 'i' is estimated using the following equation:</p> $\frac{(Year\ in\ Service)_i}{(Total\ Life)_i} * ESTP_i *$ $\frac{\sum_{j=1}^n \frac{(Funds\ Collected\ in\ NDCBALY)_j}{(Years\ in\ Service)_j} * ESTP_j}{n}$ <p>where:</p> <p>n number of units with known fund balance</p> <p>ESTP estimated funds needed at decommissioning aligned with fund balance year.</p> <p>NOTE: The fund balance year for estimated amounts is set to one year before forecast starts.</p>	NDCBAL

Parameter Meaning	Notes and comments	Variable Name
Latest reported annual payment to the fund.	<p>-1 means that the payment for a unit is not known. In this case, the payment for the unit 'i' is estimated using the following equation:</p> $(Full\ Funding\ Annuity)_i * \frac{\sum_{j=1}^n (Actual\ Payment\ Made)_j}{(Full\ Funding\ Annuity)_j}$ <p>where: n number of units with known payments to the nuclear decommissioning fund</p>	NDCAPMT
Year of last reported payment and fund balance.		NDCBALY
Planned retirement year.	We have based this on operating license expiration year.	NDRET
Early retirement year.	-1 means no early retirement is planned.	NDERET
Post retirement monitoring period.	Expressed in years.	NDPRMON
Region code	Defines NEMS electricity supply region in which the unit is located.	NUREG

In addition to the unit specific information described above, there is also a set of parameters describing the financial environment for all units. These parameters are presented in Table 2.

Table 2
Set of Parameters Common for all Nuclear Units

Parameter Meaning	Notes and Comments	Variable Name
Tax rate on fund earnings.	May vary by year.	NDTAXR
Real escalation rate of decommissioning cost estimate	Can vary by year. According with most experts nuclear decommissioning costs will raise 1% faster than inflation. In addition, there have been some recent events which caused rapid escalation in recent years.	NDESTESC
Fund administrative cost as a fraction of fund balance.		NDADMNR
Fund's real annual rate of return.	The Fund's nominal earnings are calculated using inflation data available in NEMS (variable MC_PGDP) plus the real annual rate of return.	NDAEARN
Annual monitoring cost.	The costs are expressed in \$/MW of capacity.	NDTCMON
Split of unrecovered costs when early retirement occurs.	Up until the catch up year, ratepayers were the only source of payments and the payment level only rises to reflect inflation. During the catch up year, however, payment levels are reassessed to a level necessary to recover required costs. The excess payment amount can be split among: (i) ratepayers (in addition to their normal payment), (ii) equity holders, and (iii) government. A similar splitting of excess costs can occur with early retirement.	NDPSER
Split of post-catch-up year payment made in excess to the amount allowed in the rate before the catch up year.		NDPSCU

3. Methodology

After the input data is input, the nuclear decommissioning methodology consists of three steps:

- calculate estimates of missing data
- initialize all data to start year of NEMS (1990)

- perform annual calculations

Each of the steps is discussed below.

3.1 Calculate Estimates of Missing Data

The input data base for each nuclear unit includes the balance of the fund as well as the most recent annual payment into the fund. As described above, for some nuclear units, this information was not available. For these units where the information is not available, the values must be estimated. This information is estimated in this step under the assumption that the payment patterns for these units is similar to the average pattern observed for all units for which data is available. The exact equations for the estimation process are shown in Table 1.

3.2 Initialize all Data to Start Year of NEMS (1990)

The total estimated decommissioning costs, fund balances, and fund payments for each nuclear unit are derived from the most recent data available. The purpose of this step is to adjust these inputs to reflect values applicable to 1990 (beginning of the year). This adjustment includes the impact of escalation and inflation which occurs between the beginning of 1990 and the date for which the input values actually apply.

3.3 Perform Annual Calculations

For each forecast year, the fund balance for each unit is calculated as:

$$Balance_y = Balance_{y-1} + Earnings_y - Tax_y - (Administrative Cost)_y + Payment_y$$

where the fund payment is calculated in one of two ways:

- For years before the early retirement year (if applicable) and before the input "catch up" year, the payment is calculated as the input payment adjusted for inflation.
- For all other years, the payment is calculated as the annuity payment necessary over the remaining period of collection (i.e., through the year of retirement plus any input maintenance period) to result in a fund balance sufficient to pay the current estimated decommissioning costs. Note that this calculation does not take into account any future real escalation in decommissioning costs nor any early retirement of the unit. As this escalation occurs in each subsequent year, the payment will rise accordingly. Only when the year of the early retirement is reached does the fund payment rise to reflect the shorter collection period.

Within the model, each annual fund payment can be covered by one of three sources of funds within the model: (i) the ratepayers, (ii) the equity holders, (iii) the government. The methodology

assumes that the total fund payment will continue to be collected from the ratepayers until the earlier of the "catch up" year or an early retirement year. The increase in payment that occurs in either of these years is shared between the three sources according to the input shares. Any monitoring costs are assumed to be recovered from the ratepayers as they are incurred.

We investigated the potential for changes due to a new Federal Accounting Standards Board (FASB) standard. We have not modified the EFP to reflect any changes due to the FASB standard. This was for two reasons:

- The FASB standard was not approved while we were working on this project.
- The changes discussed in drafts related solely to the reporting of decommissioning liabilities on the utility financial statements. Our judgement is that these changes are not likely to directly alter revenue requirements, and thus electricity rates.

Appendix A

Nuclear Decommissioning Data Base

Nuclear Plants Decommissioning Data

NOTE : Dollar amounts are presented in millions

Plant Name	Unit Name	Region Code	Capacity [MW]	Private Ownership Percentage	Total Estimated Cost	Year of Estimate	Total Collected to Date	Amount Collected Notes	Last Annual Payment
Alvin Vogtle	Unit 1	9	1058	0.604	264.0	1990	12.0	ICF, fund est. based on GA Pwr	3.0
Alvin Vogtle	Unit 2	9	1057	0.604	329.0	1990	15.0	ICF, fund est. based on GA Pwr	3.0
Arkansas Nuclear	Unit 1	10	903	1.000	398.6	1993	50.1	SAIC	5.6
Arkansas Nuclear	Unit 2	10	943	1.000	407.4	1993	51.2	SAIC	5.7
Beaver Valley	Unit 1	1	810	1.000	282.1	1993	-1		-1
Beaver Valley	Unit 2	1	822	1.000	255.5	1993	-1		-1
Big Rock Point		1	67	1.000	208.0	1993	72	SAIC	23.9
Braidwood	Unit 1	4	1120	1.000	320.0	1993	33.8	ICF	6.1
Braidwood	Unit 2	4	1120	1.000	320.0	1993	31.7	ICF	5.7
Brown's Ferry	Unit 1	9	1098	0.000	190.0	1990	-1		-1
Brown's Ferry	Unit 2	9	1098	0.000	190.0	1990	-1		-1
Brown's Ferry	Unit 3	9	1098	0.000	190.0	1990	-1		-1
Brunswick	Unit 1	9	790	1.000	216.3	1989	-1		-1
Brunswick	Unit 2	9	790	1.000	198.8	1989	-1		-1
Byron	Unit 1	4	1120	1.000	640.0	1993	69.8	ICF	12.5
Byron	Unit 2	4	1120	1.000	640.0	1993	65.5	ICF	11.8
Callaway		10	1150	1.000	372.0	1993	44.0	SAIC	-1
Calvert Cliffs	Unit 1	3	825	1.000	351.5	1992	46.7	SAIC	-1
Calvert Cliffs	Unit 2	3	825	1.000	351.5	1992	46.7	SAIC	-1
Catawba	Unit 1	9	1129	0.859	192.0	1990	12.3	ICF, fund est. based on Duke Pwr	2.0
Catawba	Unit 2	9	1129	0.859	208.0	1990	-1		-1
Clinton		4	933	0.868	457.9	1993	18.3	SAIC, fund est. based on Ill. Pwr	4.0
Comanche Peak	Unit 1	2	1500	1.000	254.6	1992	15.2	ICF	5.4
Comanche Peak	Unit 2	2	1500	1.000	344.5	1992	20.5	ICF	7.2
Connecticut Yankee		7	582	1.000	362.0	1994	137.8	SAIC	-1
Cooper		5	778	1.000	356.0	1989	-1		-1
Crystal River	Unit 3	8	850	1.000	307.6	1993	110	SAIC	11.9
Davis-Besse		1	860	1.000	346.5	1993	47	SAIC	-1
Diablo Canyon	Unit 1	13	1073	1.000	449.0	1993	248.8	ICF	25.0
Diablo Canyon	Unit 2	13	1087	1.000	520.0	1993	288.2	ICF	29.0
Donald Cook	Unit 1	1	1030	1.000	293.0	1991	91.3	SAIC	6.5
Donald Cook	Unit 2	1	1100	1.000	294.0	1991	91.7	SAIC	6.5
Dresden	Unit 1	4	207	1.000	215.6	1993	58.8	ICF	10.6
Dresden	Unit 2	4	794	1.000	347.0	1993	94.7	ICF	17.0
Dresden	Unit 3	4	794	1.000	343.0	1993	66.1	ICF	11.9
Duane Arnold		5	565	0.700	318.0	1992	49.8	SAIC	5.6
Edwin Hatch	Unit 1	9	776	0.625	236.0	1990	23.7	ICF, fund est. based on GA Pwr	2.6
Edwin Hatch	Unit 2	9	784	0.625	311.0	1990	31.3	ICF, fund est. based on GA Pwr	3.4
Fermi	Unit 2	1	1154	1.000	434.4	1993	23.9	SAIC	-1
Fort Calhoun		5	476	1.000	117.0	1989	-1		-1
Fort St. Vrain		12	330	1.000	157.0	1992	-1		-1
Grand Gulf		1	1250	0.900	249.0	1989	20.1	SAIC	5.0
H.B. Robinson	Unit 2	9	665	1.000	257.7	1993	67.3	SAIC	-1
Hope Creek	Unit 1	3	1031	1.000	437.3	1990	42	SAIC	-1
Indian Point	Unit 2	6	986	1.000	943.5	2013	136.6	SAIC	-1
Indian Point	Unit 3	6	135	0.000	135.0	1990	-1		-1
James Fitzpatrick	Unit 1	6	850	0.000	165.0	1990	-1		-1
Joseph Farley	Unit 1	9	812	1.000	276.0	1993	49.2	ICF	6.7

NOTE : Dollar amounts are presented in millions

Plant Name	Unit Name	Region Code	Capacity [MW]	Private Ownership Percentage	Total Estimated Cost	Year of Estimate	Total Collected to Date	Amount Collected Notes	Last Annual Payment
Joseph Farley	Unit 2	9	824	1.000	302.0	1993	53.8	ICF	7.3
Kewaunee		4	535	1.000	361.7	1993	61	SAIC	4.0
La Salle	Unit 1	4	1078	1.000	363.0	1993	42.4	ICF	7.6
La Salle	Unit 2	4	1078	1.000	363.0	1993	41.0	ICF	7.4
Limerick	Unit 1	3	1055	1.000	217.0	1993	24.1	SAIC	-1
Limerick	Unit 2	3	1055	1.000	188.0	1993	20.9	SAIC	-1
Maine Yankee		7	840	1.000	324.0	1993	94	SAIC	9.3
McGuire	Unit 1	9	1129	1.000	171.0	1990	48.6	ICF	8.0
McGuire	Unit 2	9	1129	1.000	186.0	1990	49.2	ICF	8.1
Millstone	Unit 1	7	660	1.000	381.0	1993	74.6	SAIC	-1
Millstone	Unit 2	7	870	1.000	321.6	1993	48.0	SAIC	-1
Millstone	Unit 3	7	1154	1.000	439.0	1993	44.4	SAIC	-1
Monticello		5	545	1.000	277.0	1990	130	SAIC	-1
Nine Mile Point	Unit 1	6	610	1.000	281.0	1993	78.7	SAIC	12.6
Nine Mile Point	Unit 2	6	1080	1.000	309.8	1993	40.7	SAIC	8.2
North Anna	Unit 1	9	900	0.884	220.0	1991	53.0	SAIC	-1
North Anna	Unit 2	9	887	0.884	224.0	1991	54.0	SAIC	-1
Oconee	Unit 1	9	846	1.000	165.0	1990	66.7	ICF	11.0
Oconee	Unit 2	9	846	1.000	158.0	1990	63.8	ICF	10.5
Oconee	Unit 3	9	846	1.000	203.0	1990	77.9	ICF	12.8
Oyster Creek		3	650	1.000	175.0	1993	80	SAIC	-1
Palisades		1	780	1.000	399.0	1993	99	SAIC	21.1
Palo Verde	Unit 1	12	1270	1.000	460.5	1993	14.8	ICF, fund est. based on AZ Pub Serv	2.1
Palo Verde	Unit 2	12	1270	1.000	453.6	1993	14.5	ICF, fund est. based on AZ Pub Serv	2.1
Palo Verde	Unit 3	12	1270	1.000	481.1	1993	15.4	ICF, fund est. based on AZ Pub Serv	2.2
Peach Bottom	Unit 2	3	1065	1.000	202.4	1991	24.0	SAIC, fund est. based on PECO	-1
Peach Bottom	Unit 3	3	1065	1.000	202.4	1991	24.0	SAIC, fund est. based on PECO	-1
Perry		1	1191	1.000	502.4	1993	15	SAIC	-1
Pilgrim		7	670	1.000	400.0	1991	66	SAIC	13.0
Point Beach	Unit 1	4	485	1.000	133.0	1993	101.8	SAIC	-1
Point Beach	Unit 2	4	485	1.000	147.0	1993	112.6	SAIC	-1
Prairie Island	Unit 1	5	530	1.000	190.0	1990	92.6	SAIC	-1
Prairie Island	Unit 2	5	530	1.000	163.0	1990	79.4	SAIC	-1
Quad Cities	Unit 1	4	789	1.000	345.3	1993	65.8	ICF	12.2
Quad Cities	Unit 2	4	789	1.000	345.3	1993	66.9	ICF	12.4
Rancho Seco		13	913	0.000	340.0	1994	-1		-1
River Bend		10	940	0.700	414.0	1991	14.1	SAIC	3.1
Robert E. Ginna		6	470	1.000	150.7	1993	58.3	SAIC	-1
Salem	Unit 1	3	1106	1.000	182.9	1990	162.9	SAIC, only Pub Serv E&G	-1
Salem	Unit 2	3	1106	1.000	273.0	1990	243.1	SAIC, only Pub Serv E&G	-1
San Onofre	Unit 1	13	436	1.000	270.9	1993	220.0	SAIC	-1
San Onofre	Unit 2	13	1070	1.000	605.7	1993	216.0	SAIC	-1
San Onofre	Unit 3	13	1080	1.000	732.5	1993	435.0	SAIC	-1
Seabrook		7	1150	1.000	366.0	1993	22.1	SAIC	-1
Sequoyah	Unit 1	9	1183	0.000	150.0	1990	-1		-1
Sequoyah	Unit 2	9	1183	0.000	150.0	1990	-1		-1
Shearon Harris		9	860	1.000	284.3	1993	252.7	SAIC	-1
South Texas Project	Unit 1	2	1250	1.000	213.6	1989	8.6	SAIC	4.8

NOTE : Dollar amounts are presented in millions

Plant Name	Unit Name	Region Code	Capacity [MW]	Private Ownership Percentage	Total Estimated Cost	Year of Estimate	Total Collected to Date	Amount Collected Notes	Last Annual Payment
South Texas Project	Unit 2	2	1250	1.000	259.7	1989	10.4	SAIC	5.6
St. Lucie	Unit 1	8	839	1.000	263.0	1993	72.8	SAIC	8.7
St. Lucie	Unit 2	8	839	0.851	222.0	1993	46.6	SAIC	5.6
Summer		9	885	1.000	545.3	2022	14	SAIC	2.6
Surry	Unit *	9	781	1.000	205.0	1991	52.9	SAIC	-1
Surry	Unit 2	9	781	1.000	256.0	1991	66.1	SAIC	-1
Susquehanna	Unit 1	3	1050	1.000	402.8	1993	41.5	SAIC	3.5
Susquehanna	Unit 2	3	1050	1.000	402.8	1993	41.5	SAIC	3.5
Three Mile Island	Unit 1	3	819	1.000	143.0	1993	53.7	SAIC	-1
Three Mile Island	Unit 2	3	880	1.000	229.0	1993	85.9	SAIC	-1
Trojan		11	1095	1.000	299.0	1994	48.9	ICF	11.0
Turkey Point	Unit 3	8	666	1.000	208.0	1993	106.1	SAIC	11.4
Turkey Point	Unit 4	8	666	1.000	243.0	1993	123.9	SAIC	13.4
Vermont Yankee		7	540	1.000	329.6	1994	98.9	ICF	-1
Waterford	Unit 3	10	1104	1.000	320.0	1993	17.4	SAIC	4.1
WNP	Unit 2	11	1100	1.000	403.0	1987	15.8	SAIC	-1
Wolf Creek		10	1150	1.000	370.2	1993	27.5	ICF, fund est. based on KCGL and KGE	-1
Yankee Rowe		7	167	1.000	368.0	1994	-1		-1
Zion	Unit 1	4	1040	1.000	316.0	1993	54.5	ICF	9.8
Zion	Unit 2	4	1040	1.000	316.0	1993	54.5	ICF	9.8

Plant Name	Unit Name	Fund Status Year	Last Payment Notes	Retire-ment Year	Early Retire-ment Year	Monitoring Length
Alvin Vogtle	Unit 1	1993	ICF	2027	-1	0
Alvin Vogtle	Unit 2	1993	ICF	2029	-1	0
Arkansas Nuclear	Unit 1	1994	ICF	2014	-1	0
Arkansas Nuclear	Unit 2	1994	ICF	2018	-1	0
Beaver Valley	Unit 1	-1		2016	-1	0
Beaver Valley	Unit 2	-1		2027	-1	0
Big Rock Point		1993	ICF	2000	-1	0
Braidwood	Unit 1	1993	ICF	2025	-1	0
Braidwood	Unit 2	1993	ICF	2027	-1	0
Brown's Ferry	Unit 1	-1		2013	-1	0
Brown's Ferry	Unit 2	-1		2014	-1	0
Brown's Ferry	Unit 3	-1		2016	-1	0
Brunswick	Unit 1	-1		2016	-1	0
Brunswick	Unit 2	-1		2014	-1	0
Byron	Unit 1	1993	ICF	2024	-1	0
Byron	Unit 2	1993	ICF	2026	-1	0
Callaway		1994		2024	-1	0
Calvert Cliffs	Unit 1	1993		2014	-1	0
Calvert Cliffs	Unit 2	1993		2016	-1	0
Catawba	Unit 1	1993	ICF	2024	-1	0
Catawba	Unit 2	-1		2026	-1	0
Clinton		1994	ICF	2026	-1	0
Comanche Peak	Unit 1	1993	ICF	2030	-1	0
Comanche Peak	Unit 2	1993	ICF	2033	-1	0
Connecticut Yankee		1994		2007	-1	0
Cooper		-1		2014	-1	0
Crystal River	Unit 3	1993	ICF	2016	-1	0
Davis-Besse		1994		2017	-1	0
Diablo Canyon	Unit 1	1993	ICF	2008	-1	0
Diablo Canyon	Unit 2	1993	ICF	2010	-1	0
Donald Cook	Unit 1	1993	ICF	2014	-1	0
Donald Cook	Unit 2	1993	ICF	2017	-1	0
Dresden	Unit 1	1993	ICF	2006	1978	29
Dresden	Unit 2	1993	ICF	2006	-1	0
Dresden	Unit 3	1993	ICF	2011	-1	0
Duane Arnold		1994	ICF	2014	-1	0
Edwin Hatch	Unit 1	1993	ICF	2014	-1	0
Edwin Hatch	Unit 2	1993	ICF	2018	-1	0
Fermi	Unit 2	1994		2025	-1	0
Fort Calhoun		-1		2013	-1	0
Fort St. Vrain		-1		1992	1989	3
Grand Gulf		1994	ICF	2022	-1	0
H.B. Robinson	Unit 2	1993		2010	-1	0
Hope Creek	Unit 1	1994		2026	-1	0
Indian Point	Unit 2	1993	* year ICF	2013	-1	0
Indian Point	Unit 3	-1		2015	-1	0
James Fitzpatrick	Unit 1	-1		2014	-1	0
Joseph Farley	Unit 1	1993	ICF	2017	-1	0

Plant Name	Unit Name	Fund Status Year	Last Payment Notes	Retire- ment Year	Early Retire- ment Year	Monitoring Length
Joseph Farley	Unit 2	1993	ICF	2021	-1	0
Kewaunee		1994	ICF	2013	-1	0
La Salle	Unit 1	1993	ICF	2022	-1	0
La Salle	Unit 2	1993	ICF	2023	-1	0
Limerick	Unit 1	1994		2024	-1	0
Limerick	Unit 2	1994		2029	-1	0
Maine Yankee		1994	ICF	2008	-1	0
McGuire	Unit 1	1993	ICF	2021	-1	0
McGuire	Unit 2	1993	ICF	2023	-1	0
Millstone	Unit 1	1994		2010	-1	0
Millstone	Unit 2	1994		2015	-1	0
Millstone	Unit 3	1994		2025	-1	0
Monticello		1994		2010	-1	0
Nine Mile Point	Unit 1	1994	ICF	2009	-1	0
Nine Mile Point	Unit 2	1994	ICF	2026	-1	0
North Anna	Unit 1	1994		2018	-1	0
North Anna	Unit 2	1994		2020	-1	0
Oconee	Unit 1	1993	ICF	2013	-1	0
Oconee	Unit 2	1993	ICF	2013	-1	0
Oconee	Unit 3	1993	ICF	2014	-1	0
Oyster Creek		1994		2009	-1	0
Palisades		1993	ICF	2007	-1	0
Palo Verde	Unit 1	1993	ICF	2024	-1	0
Palo Verde	Unit 2	1993	ICF	2025	-1	0
Palo Verde	Unit 3	1993	ICF	2027	-1	0
Peach Bottom	Unit 2	1994		2008	-1	0
Peach Bottom	Unit 3	1994		2008	-1	0
Perry		1994		2026	-1	0
Pilgrim		1993	ICF	2012	-1	0
Point Beach	Unit 1	1994		2010	-1	0
Point Beach	Unit 2	1994		2013	-1	0
Prairie Island	Unit 1	1994		2013	-1	0
Prairie Island	Unit 2	1994		2014	-1	0
Quad Cities	Unit 1	1993	ICF	2012	-1	0
Quad Cities	Unit 2	1993	ICF	2012	-1	0
Rancho Seco		-1		2008	1989	20
River Bend		1994	ICF	2025	-1	0
Robert E. Ginna		1994		2009	-1	0
Salem	Unit 1	1994		2016	-1	0
Salem	Unit 2	1994		2020	-1	0
San Onofre	Unit 1	1994		2013	1992	21
San Onofre	Unit 2	1994		2013	-1	0
San Onofre	Unit 3	1994		2013	-1	0
Seabrook		1994		2026	-1	0
Sequoyah	Unit 1	-1		2020	-1	0
Sequoyah	Unit 2	-1		2021	-1	0
Shearon Harris		1994		2026	-1	0
South Texas Project	Unit 1	1994	ICF	2027	-1	0

Plant Name	Unit Name	Utility Name	Data Sources/ Estimate Methods
Alvin Vogtle	Unit 1	Southern Co. (45.7%), Oglethorpe Pwr Co (30%), others (24.3%)	
Alvin Vogtle	Unit 2	Southern Co. (45.7%), Oglethorpe Pwr Co (30%), others (24.3%)	
Arkansas Nuclear	Unit 1	Entergy Corp.	
Arkansas Nuclear	Unit 2	Entergy Corp.	
Beaver Valley	Unit 1	DQE (47.5%), Ohio Ed. (52.5%)	
Beaver Valley	Unit 2	DQE (13.7%), Ohio Ed. (41.9%), Centerior E. (44.4%)	
Big Rock Point		Consumer's Power	
Braidwood	Unit 1	Commonwealth Edison	
Braidwood	Unit 2	Commonwealth Edison	
Brown's Ferry	Unit 1	TVA (operating owner)	
Brown's Ferry	Unit 2	TVA (operating owner)	
Brown's Ferry	Unit 3	TVA (operating owner)	
Brunswick	Unit 1	Carolina Power & Light Co. (81.67%), N.C. Eastern Municipal (18.33%)	
Brunswick	Unit 2	Carolina Power & Light Co. (81.67%), N.C. Eastern Municipal (18.33%)	
Byron	Unit 1	Commonwealth Edison	
Byron	Unit 2	Commonwealth Edison	
Callaway		Union Electric Co.	
Calvert Cliffs	Unit 1	Baltimore Gas & Electric Co.	
Calvert Cliffs	Unit 2	Baltimore Gas & Electric Co.	
Catawba	Unit 1	Duke Pwr (12.5%), NCPMA (37.5%), NCEMC (28.125%), PMPA (12.5%), Saluda River (9.375%)	
Catawba	Unit 2	ABOVE BREAKDOWN IS FOR ENTIRE PLANT (Duke Pwr owns 25% of unit 1)	
Clinton		Ill. Pwr (86.79%), Soyland Pwr Co-op and West. Ill. Pwr. Co-op (13.2%)	
Comanche Peak	Unit 1	Texas Utilities Electric Co.	
Comanche Peak	Unit 2	Texas Utilities Electric Co.	
Connecticut Yankee		Northeast Utils (49%), N.E. Elec (15%), Boston Ed (9.5%), United Illum. Co. (9.5%), COMEnergy (4.5%), others (12.5%)	
Cooper		Nebraska Public Power District (operating owner)	
Crystal River	Unit 3	Florida Progress (90.4%), participating utils. (9.6%)	
Davis-Besse		Centerior	
Diablo Canyon	Unit 1	Pacific Gas and Electric Co.	
Diablo Canyon	Unit 2	Pacific Gas and Electric Co.	
Donald Cook	Unit 1	American E. Pwr (sub. Indiana Michigan Power Co.)	
Donald Cook	Unit 2	American E. Pwr (sub. Indiana Michigan Power Co.)	
Dresden	Unit 1	Commonwealth Edison Co.	
Dresden	Unit 2	Commonwealth Edison Co.	
Dresden	Unit 3	Commonwealth Edison Co.	
Duane Arnold		IES Utils (70%), Central Iowa P Co-op (20%), Corn Belt P. Co-op (10%)	
Edwin Hatch	Unit 1	Southern Co. (50.1%), Oglethorpe Pwr (30%), others (19.9%)	
Edwin Hatch	Unit 2	Southern Co. (50.1%), Oglethorpe Pwr (30%), others (19.9%)	
Fermi	Unit 2	Detroit Edison Co.	
Fort Calhoun		Omaha Public Power District (operating owner)	
Fort St. Vrain		PS Colorado	
Grand Gulf		Entergy Corp. (90%), South MS Elec. Pwr. (10%)	
H.B. Robinson	Unit 2	Carolina Power & Light Co.	
Hope Creek	Unit 1	Public Serv. Enterprise (95%), Atlantic Energy (5%)	
Indian Point	Unit 2	Consolidated Edison	
Indian Point	Unit 3	New York Power Authority	
James Fitzpatrick	Unit 1	New York Power Authority	
Joseph Farley	Unit 1	Southern Co.	

Plant Name	Unit Name	Fund Status Year	Last Payment Notes	Retire-ment Year	Early Retire-ment Year	Monitoring Length
South Texas Project	Unit 2	1994	ICF	2028	-1	0
St. Lucie	Unit 1	1994		2016	-1	0
St. Lucie	Unit 2	1994		2023	-1	0
Summer		1994	ICF	2022	-1	0
Surry	Unit 1	1993		2012	-1	0
Surry	Unit 2	1993		2013	-1	0
Susquehanna	Unit 1	1994	ICF	2022	-1	0
Susquehanna	Unit 2	1994	ICF	2024	-1	0
Three Mile Island	Unit 1	1994		2014	-1	0
Three Mile Island	Unit 2	1994		2014	-1	0
Trojan		1993	ICF	2006	1992	6
Turkey Point	Unit 3	1993		2007	-1	0
Turkey Point	Unit 4	1993		2007	-1	0
Vermont Yankee		1993	* year ICF	2012	-1	0
Waterford	Unit 3	1994	ICF	2024	-1	0
WNP	Unit 2	1992		2023	-1	0
Wolf Creek		1993		2025	-1	0
Yankee Rowe		-1		2000	1990	5
Zion	Unit 1	1993	ICF	2013	-1	0
Zion	Unit 2	1993	ICF	2013	-1	0

Plant Name	Unit Name	Utility Name	Data Sources/ Estimate Methods
Joseph Farley	Unit 2	Southern Co.	
Kewaunee		WPL Holdings (41%), WI Pub Serv (41.2%), others (17.8%)	
La Salle	Unit 1	Commonwealth Edison	
La Salle	Unit 2	Commonwealth Edison	
Limerick	Unit 1	PECO Energy Co. (formerly Philadelphia Electric)	
Limerick	Unit 2	PECO Energy Co. (formerly Philadelphia Electric)	
Maine Yankee		Maine Yankee Atomic Pwr (owned by several New England utils)	
McGuire	Unit 1	Duke Power Co.	
McGuire	Unit 2	Duke Power Co.	
Millstone	Unit 1	Northeast Utilities	
Millstone	Unit 2	Northeast Utilities	
Millstone	Unit 3	Northeast Utils (68%), New England Elec (12.2%), [others (19.8%) Conn. Light & Pwr.]	
Monticello		Northern States Power Co.	
Nine Mile Point	Unit 1	Niagara Mohawk	
Nine Mile Point	Unit 2	Niagara Mohawk (41%), NY State E&G (18%), Long Is. Lighting (18%), Rochester G&E (14%), Cent. Hudson G&E (9%)	
North Anna	Unit 1	Old Dominion Electric Coop (11.6%) Dominion Resources(88.4%)	
North Anna	Unit 2	Old Dominion Electric Coop (11.6%) Dominion Resources(88.4%)	
Oconee	Unit 1	Duke Power	
Oconee	Unit 2	Duke Power	
Oconee	Unit 3	Duke Power	
Oyster Creek		Jersey Central Power & Light Co. (sub. of General Utils.)	
Palisades		Consumer's Power Co.	
Palo Verde	Unit 1	AZ Pub Serv (29.1%), El Paso Elec (15.8%), SCEcorp (15.8%), Pub Serv NM (19.2%), others (29.1%)	
Palo Verde	Unit 2	AZ Pub Serv (29.1%), El Paso Elec (15.8%), SCEcorp (15.8%), Pub Serv NM (19.2%), others (29.1%)	
Palo Verde	Unit 3	AZ Pub Serv (29.1%), El Paso Elec (15.8%), SCEcorp (15.8%), Pub Serv NM (19.2%), others (29.1%)	
Peach Bottom	Unit 2	PECO Energy (42.5%), Pub. Serv. Enterprises (42.5%), Atlantic Energy (7.5%), Delmarva Power (7.5%)	
Peach Bottom	Unit 3	PECO Energy (42.5%), Pub. Serv. Enterprises (42.5%), Atlantic Energy (7.5%), Delmarva Power (7.5%)	
Perry		Centerior (51%), Ohio Edison (35.2%), DQE Inc. (13.8%)	
Pilgrim		Boston Edison Co.	
Point Beach	Unit 1	Wisconsin Energy	
Point Beach	Unit 2	Wisconsin Energy	
Prairie Island	Unit 1	Northern States Power Co.	
Prairie Island	Unit 2	Northern States Power Co.	
Quad Cities	Unit 1	Commonwealth Edison Co. (75%), Iowa-Ill. G&E (25%)	
Quad Cities	Unit 2	Commonwealth Edison Co. (75%), Iowa-Ill. G&E (25%)	
Rancho Seco		Sac. Mun. Util.	
River Bend		Entergy Corp (70%), Cajun Elec Pwr Co (30%)	
Robert E. Ginna		Rochester Gas & Electric Corp.	
Salem	Unit 1	Pub Serv Ent. (42.6%), PECO (42.6%), Delmarva (7.4%), Atlantic Energy (7.4%)	
Salem	Unit 2	Pub Serv Ent. (42.6%), PECO (42.6%), Delmarva (7.4%), Atlantic Energy (7.4%)	
San Onofre	Unit 1	SCE Corp (80%), San Diego G&E (20%)	
San Onofre	Unit 2	SCE Corp (75%), San Diego G&E (20%), others (5%)	
San Onofre	Unit 3	SCE Corp (75%), San Diego G&E (20%), others (5%)	
Seabrook		Northeast Utils (39.6%), N.E. Elec (9.9%), United Illum (17.5%), Eastern Utils (12.1%), others (21%)	
Sequoyah	Unit 1	TVA (% share NA)	
Sequoyah	Unit 2	TVA (% share NA)	
Shearon Harris		Carolina Power & Light Co (83.8%), N.C. Eastern Municipal Pwr (16.2%)	
South Texas Project	Unit 1	Houston L&P (30.8%), Central & S.W. Corp (25.2%), City Pub. Svc. San Antonio (28%), City of Austin (16%)	

Plant Name	Unit Name	Utility Name	Data Sources/ Estimate Methods
South Texas Project	Unit 2	Houston L&P (30.8%), Central & S.W. Corp (25.2%), City Pub. Svc. San Antonio (28%), City of Austin (16%)	
St. Lucie	Unit 1	FPL Group	
St. Lucie	Unit 2	FPL (85.1%), Florida Municipal Pwr (8.8%), Orlando Util. Comm. (6.1%)	
Summer		SCE (67%), others (33%)	
Surry	Unit 1	Dominion Resources	
Surry	Unit 2	Dominion Resources	
Susquehanna	Unit 1	Pennsylvania Power & Light Co (90%), others (10%)	
Susquehanna	Unit 2	Pennsylvania Power & Light Co (90%), others (10%)	
Three Mile Island	Unit 1	General Public Utils	
Three Mile Island	Unit 2	General Public Utils	
Trojan		Portland General Electric Co	
Turkey Point	Unit 3	FPL Group	
Turkey Point	Unit 4	FPL Group	
Vermont Yankee		Central Vermont P.S. (31.3%), N.E. Elec (20%), Green Mountain Pwr (17.9%), Northeast Utils (16%), Central M.P. (4%),	
Waterford	Unit 3	Entergy Corp	
WNP	Unit 2	Washington Public Power Supply System (operating utility)	
Wolf Creek		Kansas City P&L (47%), Kansas G&E (47%), others (6%)	
Yankee Rowe		Yankee Atomic	
Zion	Unit 1	Commonwealth Edison Co	
Zion	Unit 2	Commonwealth Edison Co	