

2018 ESCALATION ANALYSIS
for the
VOGTLE ELECTRIC GENERATING PLANT
DECOMMISSIONING COST STUDY



prepared for

SOUTHERN NUCLEAR OPERATING COMPANY

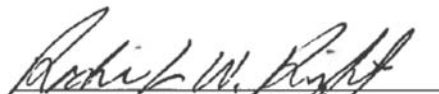
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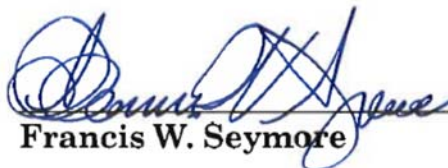
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DECOMMISSIONING COST ESCALATION STUDY

Purpose

This report presents escalated costs for the estimates of the costs to decommission the Vogtle Electric Generating Plant (Vogtle) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates, escalated to the year of expenditure dollars, are designed to provide the Southern Nuclear Operating Company (Southern) with the information to assess its current decommissioning liability, as it relates to Vogtle.

Basis

This escalation analysis is based upon the recent decommissioning cost analysis performed for Vogtle.¹ Explanatory information from this report is provided below.

Operating licenses were issued for Vogtle Unit 1 and Unit 2 in 1987 and 1989, respectively. Southern was granted License Renewals by the NRC for the Vogtle reactors on June 3, 2009. Therefore, for the purposes of this study, the final shutdown dates (license expiration) are based on the current, 60-year operating life, with the permanent cessation of operations scheduled for January 16, 2047 and February 9, 2049 for Units 1 and 2, respectively.

The DECON decommissioning scenario was evaluated for the Vogtle nuclear units. It assumes that the decommissioning of the Vogtle site will be a coordinated effort between the two units. Both units will be promptly decommissioned upon the expiration of their operating license, i.e., in 2047 and 2049.

Spent fuel storage operations continue at the site until the transfer of the fuel to an appropriate disposal facility is complete, assumed to be in the year 2078.

The primary objectives of a Vogtle decommissioning project would be to remove the facility from service, reduce residual radioactivity to levels permitting unrestricted release, restore the site, perform this work safely, and complete the work in a cost-effective manner. Consideration must be given to the cost of the decommissioning project, minimization of occupational radiation exposure, availability of low-level waste disposal facilities, availability of a high-level waste (spent fuel) repository or Department of Energy (DOE) interim storage facility, regulatory requirements, and

¹ "Decommissioning Cost Study for the Vogtle Electric Generating Plant," Document S18-1754-002, Rev. 0, TLG Services, Inc., October 2018

public concerns. In addition, 10 CFR 50.82(a)(3) requires decommissioning to be completed within 60 years of permanent cessation of operations.

Under the DECON methodology, the facility is transitioned to a decommissioning project soon after final shutdown. Spent fuel is removed from the reactor and placed within the spent fuel pools, awaiting eventual transfer to the on-site dry fuel storage facility, or direct transfer to the U.S. Department of Energy. Plant systems are drained and deenergized to conform to the site project schedule. Contaminated materials are removed, packaged, shipped and disposed of offsite. Clean materials are surveyed for radioactive contamination and released as scrap metal or construction debris. Following the license termination survey and termination of the NRC licenses on the power plant (the dry fuel storage ISFSI will remain under the NRC license until all fuel is shipped to the DOE and the ISFSI decommissioned), all site structures are removed to three foot below grade elevation, and the subgrade voids backfilled with concrete rubble and structural fill. The site is finally graded to conform to the surrounding area, and native vegetation placed for erosion control.

An Independent Spent Fuel Storage Installation (ISFSI) has been constructed adjacent to the power block. The spent fuel will be relocated from the spent fuel pools in the fuel handling buildings to the ISFSI to await transfer to a DOE facility. Assuming the first fuel shipment date is in 2040, the decommissioning estimate assumes that the removal of spent fuel from the site could be completed by the end of year 2078.

The currently projected total costs (in thousands of 2018 dollars) to decommission the nuclear station, for the DECON scenario analyzed, are as follows:

Unit 1	\$889,495
Unit 2	\$953,482
Station Total	\$1,842,977

The costs include the monies anticipated to be spent for operating license termination (radiological remediation), interim spent fuel storage and site restoration activities. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site remediation and restoration requirements.

The following table reflects the percentage of each cost component relative to the total costs to decommission Vogtle:

Escalation Category	Unit 1		Unit 2	
	Costs (Thousands of 2018\$)	% of Total Cost	Costs (Thousands of 2018\$)	% of Total Cost
Labor	498,659	56.1	544,531	57.1
Equipment & Material	170,112	19.1	186,980	19.6
Energy	4,003	0.5	4,057	0.4
LLRW Disposal	107,122	12.0	124,197	13.0
Other Items	109,600	12.3	93,717	9.8

The site-specific cost estimate was prepared by TLG Services, Inc. (TLG) in year-end 2018 (i.e., nominal) dollars. Because the actual decommissioning will not occur for many years and may continue for decades, the nominal-dollar estimates must be escalated into the year of expenditure if a Net Present Value for each unit of the decommissioning estimate is required. That is, we must determine the dollar value of each year's expenditure at the time it is expected to be incurred. Those escalated dollars then provide the basis for financial planning and asset management. Because many of the decommissioning activities occur long in the future, small fluctuations in escalation on the cost side, and investment earnings on the trust balance side, have a substantial impact on the resources required over the long periods of time associated with most decommissioning scenarios.

Methodology

In this analysis, TLG reviewed each of the five escalation cost components separately to determine the rate by which each component was expected to escalate annually. The following narrative describes the methodology used to escalate the schedules of decommissioning expenditures.

Having developed estimates of the cost to decommission Vogtle using the DECON scenario, the mathematics to transform those costs to the year in which they will actually be incurred is relatively straightforward. The key to the analysis is selecting the appropriate forecasting indices for each of the major cost components. For that, TLG has relied upon NRC publications and the industry-wide recognized expertise of IHS-Markit.

In support of calculating the minimum funding assurance, the NRC divides its reference costs for decommissioning into categories of labor, energy, and Low Level

Radioactive Waste (LLRW) disposal. To provide guidance to operators and regulators and promote uniformity, the NRC periodically revises NUREG-1307, "Report on Waste Burial Charges." NUREG-1307 is helpful in that it identifies the appropriate indices that should be used to escalate the labor and energy cost components and provides historical changes in low level radioactive waste disposal costs.

TLG also allocates its costs for decommissioning into categories, with the NRC's labor category further subdivided into "labor," "equipment and materials," and an "other" category for miscellaneous fees, taxes and other unique or one-time expenditures.

Consistent with standards defined in the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC), Topic 410-20,^[2] TLG develops future cash flows by escalating four of the cost categories (labor, equipment and materials, energy and other) with indices provided by IHS-Markit of Lexington, MA. IHS-Markit is a privately held company which acquired Global Insight in 2008. The combined company includes well-known businesses such as Cambridge Energy Research Associates (CERA), Jane's Information Group, and IHS Herold; it also includes the former companies known as DRI (Data Resources, Inc.) and WEFA (Wharton Econometric Forecasting Associates).

IHS-Markit has no direct index for escalation of low level radioactive waste disposal costs. The inflation index used for radioactive waste burial costs is the IHS-Markit Consumer Price Index, Services with an additional 1% per year to account for the historical difference between low-level waste disposal rates reported in NRC NUREG-1307 documents and inflation rates reported by the Bureau of Labor Statistics (CPI).

Since the timeframe of decommissioning typically exceeds that of the published indices, for years beyond the published index, the inflation factor is determined using a "moving-average" method, averaging the most recent 25 years of indices to determine the future year index. This is a well-accepted methodology for determining longer-term projections and one that has been reviewed and deemed appropriate by IHS-Markit as well.

² Accounting Standards Codification, Topic 410-20, Financial Accounting Standards Board, July 2009.

ASC 410-20-55-14 states: "It is expected that uncertainties about the amount and timing of future cash flows can be accommodated by using the expected present value technique and therefore will not prevent the determination of a reasonable estimate of fair value."

Approach

The base year (2018) costs for the DECON scenario were extracted from Reference 1, Tables 3.1 and 3.2. For both units, plus the station total, this requires the escalation of three separate cash flows (Tables 1 through 3).

The cost elements in Tables 1 through 3 are assigned to one of three subcategories: “License Termination,” “Spent Fuel Management,” and “Site Restoration.” The subcategory “License Termination” is used to accumulate costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the plant’s operating license, recognizing that there may be some additional cost impact from spent fuel management.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the pool to an appropriate disposal facility or to the ISFSI for interim storage, and the transfer of the multipurpose canisters from the ISFSI. Costs are also included for the operations of the pool and management of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location is complete.

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

Decommissioning costs were divided into the five escalation categories, for which future rate of inflation factors were established. The five categories are:

<i>Labor</i>	Wages, fringes and benefits for craft, salaries and benefits for professional workers, clerical, administrative, service, contract workers, as well as for certain trades
<i>Equipment & Material</i>	Heavy equipment, specialty tooling, spent fuel canisters and shield overpacks, waste packaging, small tools, construction materials, consumables, rental equipment and temporary construction facilities
<i>Energy</i>	Electrical power purchases (as a large industrial customer) to support site operations

<i>LLRW Disposal</i>	Costs for the processing of low-level radioactive waste as well as for the controlled disposal of material that cannot be recovered (released for unrestricted use)
<i>Other</i>	Site operating costs (not already accounted for), for example, taxes, fees, and costs for specialized services and project support activities (may include unspecified contributions from labor, equipment and materials, and transportation), and payments for one-time disposal services (e.g., GTCC)

Escalation

The following escalation indices were established for each of the five cost categories. The escalation indices for Labor, Equipment and Material, Energy and Other were provided by IHS-Markit Company via their DataInsight-Web online service. The indices used show the last update as 6 September 2018. IHS-Markit does not provide historical or projections for disposal costs of radioactive waste. As such, a TLG-developed LLRW Disposal/Recycling index was used in this escalation analysis. This index is a combination of historical information through 2016 from NRC publications for disposal site rates and projections using the Consumer Price Index, Services information provided by IHS-Markit as discussed previously.

Forecast data for labor, equipment/ materials, energy, and general inflation were available through 2043. In order to extrapolate beyond the available IHS-Markit data, TLG calculated a 25-year moving average inflation factor to extend the IHS-Markit indices through 2079, the latest end point of the Vogtle decommissioning cash flows.

Index Selection

The following table identifies the IHS-Markit forecast data sets used for the four cost categories (exclusive of LLRW disposal). Consistent with the NRC's guidance, TLG escalates the labor component of its decommissioning cost estimates using an Employment Cost Index (ECI) and the energy cost component with a Producer Price Index (PPI).

Use of the Consumer Price Index (CPI) for general services, site operating costs and one-time expenditures is consistent with the intent of the index (the measure of the average change in prices over time of goods and services).

IHS-Markit Forecast Database	TLG Cost Category
ECI Total Compensation (ECIPCTNS)	Labor Expenditures Inflation
Producer Price Index, Machinery & Equipment (WPIP11)	Equipment/Material Expenditures Inflation
Producer Price Index, Fuels and Related Products and Power (WPIP05)	Energy Expenditures Inflation
Consumer Price Index, Services (CUSASNS)	Other Items Expenditures Inflation
TLG-Developed LLRW Disposal Price Index [Historical data based upon NRC published data; forecast data based upon the Consumer Price Index, Services (CUSASNS) plus 1% additional to reflect above-inflation increases observed relative to the NRC data]	LLRW Disposal / Recycling

Labor

The decommissioning process is labor intensive, with labor representing more than half of the total cost. The estimates for Vogtle include the cost of the craft labor performing field activities, the field supervision and support services, project management, administration, security, and costs for specialty contractors. The Employment Cost Index (ECI) is a quarterly measure of changes in labor costs. It is one of the principal economic indicators used by the Federal Reserve Bank. The index shows changes in wages and salaries and benefit costs, as well as changes in total compensation. The ECIPCTNS index, provided by IHS-Markit, is a yearly estimate of change in the cost of labor, defined as compensation per employee hour worked. The self-employed, owners-managers, and unpaid family workers are excluded from coverage. The ECI is designed as a fixed-weight index at the occupational level, thus eliminating the effects of employment shifts among occupations. Both components of compensation, wages/salaries, and benefits, are covered.

In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which the labor costs will escalate over time.

Equipment and Material

Equipment and material costs in the decommissioning estimates include small tools and consumables as well as the heavy construction equipment involved in the dismantling, demolition and movement of materials around the site. The Producer Price Indexes (PPI) measures monthly average changes in selling prices received by domestic producers for their output. Most of the information used in the PPI is obtained by sampling of industries in the mining and manufacturing sectors of the economy. The indexes reflect price trends for a constant set of goods and services representing the total output of an industry.

In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which the equipment and material costs will escalate over time.

Energy

Energy costs in the decommissioning estimate include only direct energy purchases, primarily electric power and fuel oil for heating. TLG uses a broad based power escalation index, the Producers Price Index for Fuels and Related Products and Power (WPIP05). While the WPIP05 index has some volatility (since it tracks in part the price of oil), the cost of energy in the decommissioning estimates is a small percentage and therefore has little effect on the overall escalation rate for decommissioning cost.

In addition to TLG's judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which energy costs will escalate over time.

Low-Level Radioactive Waste Disposal

The inflation index used for radioactive waste burial costs is the IHS-Markit Consumer Price Index, Services with an additional 1% per year to account for differences (past 20 years) between low-level waste disposal rates reported in NRC NUREG-1307 documents and general inflation rate (CUSASNS) reported by the Bureau of Labor Statistics.

Other

"Other" costs in the decommissioning estimates include such items as licensing fees, taxes, special services (for example, a fee for the geologic disposal of Greater-than-Class C waste), as well as labor-intensive activities such as radiological surveys that include costs for off-site analytical services. Because the "Other" costs contain this variety of cost components, TLG uses the Consumer Price Index, Services to project future expenditures. The CUSASNS index measures changes in the prices of services. It is therefore more representative of the cost elements included in the

decommissioning estimates. Accordingly, the use of the CUSASNS index for “Other” costs reflects more accurately the cost components with the “Other” category than the use of the “Labor” escalation factor as a proxy.

In addition to TLG’s judgment, IHS-Markit has confirmed that the selected index is appropriate to use in determining the rate at which the “other” costs will escalate over time.

Results

With the proper escalation indices identified, TLG escalated the cost per year for the five escalation categories using the IHS-Markit index corresponding to that year and escalation category. Tables 1 through 3 provide escalated schedules of annual expenditures for the DECON scenario for each Vogtle unit individually, plus a combined total of both units. The schedules detail each of the five cost categories through to the end of the decommissioning period (*i.e.*, 2079) for Total Costs, as well as the three cost categories of License Termination, Spent Fuel Management, and Site Restoration.

No discounting of the escalated dollars was performed.

Using the escalated cash flows for each unit, TLG determined the single-value yearly escalation rate which yielded the same sum of escalated dollars for each of the three tables. The rate, referred to as a composite average annual escalation rate, is tabulated for the three decommissioning cost cash flows as follows:

Unit 1	2.693%
Unit 2	2.699%
Station Total	2.702%

In a similar fashion, the composite average annual escalation rates for each of the five escalation categories can be developed. The following table details the composite annual average rates for the DECON decommissioning scenario.

	Composite Average Annual Rate (%)		
Escalation Category	Unit 1	Unit 2	Station
Labor	2.783	2.781	2.788
Equipment/ & Material	1.220	1.221	1.217
Energy	2.176	2.172	2.208
LLRW Disposal	3.815	3.811	3.820
Other Items	2.797	2.794	2.803

Similarly, the composite average annual escalation rates for the three cost categories identified in the decommissioning cost estimate can also be developed. The values for the DECON decommissioning scenario are provided in the following table.

	Composite Average Annual Rate (%)		
Escalation Category	Unit 1	Unit 2	Station
License Termination	2.843	2.858	2.857
Spent Fuel Management	2.503	2.469	2.492
Site Restoration	2.276	2.208	2.242

Vogtle Electric Generating Plant
2018 Escalation Analysis

ESCALATION ANALYSIS OF CASHFLOWS

Source Documentation:	Decommissioning Cost Study for the Vogtle Electric Generating Plant
Source Document Number:	S18-1754-002 Rev. 0
	Tables 3.1a, 3.1b, 3.1c and 3.1d
Unit Identification	Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 1
Estimate basis year:	2018
Decommissioning Scenario:	DECON
Operating Lifetime	Decommissioning After 60 Year Operation

Single Value Escalation % by Major Cost Categories				
Single value escalations: Cost Category	Single-value Yearly Escal.	Total Costs		
		2018 \$	Escalated \$	
Total Costs	2.693%	889,495	2,301,599	
License Termination Costs	2.843%	627,574	1,594,261	
Spent Fuel Management Costs	2.503%	183,845	516,931	
Site Restoration Costs	2.276%	78,076	190,403	
Labor Costs	2.783%	498,659	1,325,373	
Equipment & Material Costs	1.220%	170,112	257,807	
Energy Costs	2.176%	4,003	7,925	
LLRW Disposal Costs	3.815%	107,122	371,570	
Other Costs	2.797%	109,600	338,924	

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 1 DECON Cash Flows by Category - Decommissioning After 60 Year Operation Total Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	147,369	17,088	1,205	198	61,414	227,274
2048	166,421	45,217	1,899	55,540	19,674	288,751
2049	161,474	49,522	1,247	98,597	21,868	332,708
2050	138,600	31,956	1,097	73,940	17,271	262,864
2051	127,947	22,886	1,027	61,570	14,996	228,426
2052	103,726	19,649	795	54,114	29,904	208,188
2053	10,940	475	0	42	2,962	14,419
2054	11,233	481	0	44	3,043	14,801
2055	76,462	3,206	228	162	3,918	83,976
2056	43,864	16,975	151	0	2,901	63,891
2057	44,921	17,140	154	0	2,972	65,187
2058	33,058	11,530	102	0	2,789	47,479
2059	9,095	757	0	0	2,364	12,216
2060	9,366	769	0	0	2,435	12,570
2061	9,593	776	0	0	2,495	12,864
2062	9,853	786	0	0	2,563	13,202
2063	10,120	796	0	0	2,633	13,549
2064	10,422	808	0	0	2,712	13,942
2065	10,675	816	0	0	2,779	14,270
2066	10,965	826	0	0	2,855	14,646
2067	11,262	836	0	0	2,934	15,032
2068	11,600	849	0	0	3,022	15,471
2069	11,883	857	0	0	3,097	15,837
2070	12,205	868	0	0	3,182	16,255
2071	12,535	879	0	0	3,269	16,683
2072	12,910	892	0	0	3,368	17,170
2073	13,224	901	0	0	3,451	17,576
2074	13,581	912	0	0	3,545	18,038
2075	13,948	923	0	0	3,642	18,513
2076	14,364	937	0	0	3,752	19,053
2077	14,711	946	0	0	3,844	19,501
2078	15,162	2,857	0	0	74,796	92,815
2079	21,884	2,691	20	27,363	22,474	74,432
Totals	1,325,373	257,807	7,925	371,570	338,924	2,301,599

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 1 DECON Cash Flows by Category - Decommissioning After 60 Year Operation License Termination Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	140,752	6,998	1,205	198	38,071	187,224
2048	152,055	24,967	1,899	55,540	15,098	249,559
2049	148,962	32,769	1,247	98,597	18,461	300,036
2050	128,396	21,495	1,097	73,940	13,770	238,698
2051	118,866	15,680	1,027	61,570	11,399	208,542
2052	94,399	14,335	795	54,114	27,580	191,223
2053	5,160	358	0	42	2,213	7,773
2054	5,298	362	0	44	2,273	7,977
2055	67,810	2,318	223	162	3,091	73,604
2056	229	0	0	0	843	1,072
2057	234	0	0	0	863	1,097
2058	156	0	0	0	576	732
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	550	1,834	0	0	70,918	73,302
2079	5,751	497	0	27,363	19,811	53,422
Totals	868,618	121,613	7,493	371,570	224,967	1,594,261

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 1 DECON Cash Flows by Category - Decommissioning After 60 Year Operation Spent Fuel Management Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	5,279	10,090	0	0	23,342	38,711
2048	10,728	20,201	0	0	4,576	35,505
2049	8,971	16,647	0	0	3,407	29,025
2050	5,290	9,674	0	0	3,501	18,465
2051	3,359	6,055	0	0	3,597	13,011
2052	5,666	4,674	0	0	2,324	12,664
2053	5,780	117	0	0	749	6,646
2054	5,935	119	0	0	770	6,824
2055	7,616	396	4	0	801	8,817
2056	8,233	410	151	0	1,173	9,967
2057	8,431	414	154	0	1,202	10,201
2058	8,728	534	102	0	1,608	10,972
2059	9,095	757	0	0	2,364	12,216
2060	9,366	769	0	0	2,435	12,570
2061	9,593	776	0	0	2,495	12,864
2062	9,853	786	0	0	2,563	13,202
2063	10,120	796	0	0	2,633	13,549
2064	10,422	808	0	0	2,712	13,942
2065	10,675	816	0	0	2,779	14,270
2066	10,965	826	0	0	2,855	14,646
2067	11,262	836	0	0	2,934	15,032
2068	11,600	849	0	0	3,022	15,471
2069	11,883	857	0	0	3,097	15,837
2070	12,205	868	0	0	3,182	16,255
2071	12,535	879	0	0	3,269	16,683
2072	12,910	892	0	0	3,368	17,170
2073	13,224	901	0	0	3,451	17,576
2074	13,581	912	0	0	3,545	18,038
2075	13,948	923	0	0	3,642	18,513
2076	14,364	937	0	0	3,752	19,053
2077	14,711	946	0	0	3,844	19,501
2078	14,612	1,023	0	0	3,878	19,513
2079	0	0	0	0	222	222
Totals	320,940	86,488	411	0	109,092	516,931

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 1 DECON Cash Flows by Category - Decommissioning After 60 Year Operation Site Restoration Costs - Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	1,338	0	0	0	0	1,338
2048	3,638	49	0	0	0	3,687
2049	3,541	107	0	0	0	3,648
2050	4,914	787	0	0	0	5,701
2051	5,722	1,151	0	0	0	6,873
2052	3,661	639	0	0	0	4,300
2053	0	0	0	0	0	0
2054	0	0	0	0	0	0
2055	1,036	492	0	0	26	1,554
2056	35,402	16,565	0	0	885	52,852
2057	36,255	16,725	0	0	907	53,887
2058	24,174	10,996	0	0	605	35,775
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	16,133	2,194	20	0	2,441	20,788
Totals	135,814	49,705	20	0	4,864	190,403

Vogtle Electric Generating Plant
2018 Escalation Analysis

ESCALATION ANALYSIS OF CASHFLOWS

Source Documentation:	Decommissioning Cost Study for theVogtle Electric Generating Plant
Source Document Number:	S18-1754-002 Rev. 0
	Tables 3.2a, 3.2b, 3.2c and 3.2d
Unit Identification	Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 2
Estimate basis year:	2018
Decommissioning Scenario:	DECON
Operating Lifetime	Decommissioning After 60 Year Operation

Single Value Escalation % by Major Cost Categories				
Single value escalations: Cost Category	Single-value Yearly Escal.	Total Costs		
		2018 \$	Escnlated \$	
Total Costs	2.699%	953,482	2,569,674	
License Termination Costs	2.858%	686,908	1,850,882	
Spent Fuel Management Costs	2.469%	170,847	491,397	
Site Restoration Costs	2.208%	95,728	227,391	
Labor Costs	2.781%	544,531	1,499,377	
Equipment & Material Costs	1.221%	186,980	289,795	
Energy Costs	2.172%	4,057	8,361	
LLRW Disposal Costs	3.811%	124,197	461,739	
Other Costs	2.794%	93,717	310,402	

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 2 DECON Cash Flows by Category - Decommissioning After 60 Year Operation Total Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2049	126,331	14,217	1,172	198	30,621	172,539
2050	163,401	37,791	1,983	55,031	19,688	277,894
2051	170,047	47,172	1,300	111,993	22,670	353,182
2052	181,151	37,139	1,166	97,129	18,940	335,525
2053	189,859	29,875	1,069	86,405	16,227	323,435
2054	168,086	28,548	888	72,834	26,416	296,772
2055	105,777	9,122	356	10,786	11,941	137,982
2056	48,860	24,038	151	0	2,904	75,953
2057	50,037	24,271	154	0	2,975	77,437
2058	36,470	16,219	102	0	2,791	55,582
2059	9,095	757	0	0	2,364	12,216
2060	9,366	769	0	0	2,435	12,570
2061	9,593	776	0	0	2,495	12,864
2062	9,853	786	0	0	2,563	13,202
2063	10,120	796	0	0	2,633	13,549
2064	10,422	808	0	0	2,712	13,942
2065	10,675	816	0	0	2,779	14,270
2066	10,965	826	0	0	2,855	14,646
2067	11,262	836	0	0	2,934	15,032
2068	11,600	849	0	0	3,022	15,471
2069	11,883	857	0	0	3,097	15,837
2070	12,205	868	0	0	3,182	16,255
2071	12,535	879	0	0	3,269	16,683
2072	12,910	892	0	0	3,368	17,170
2073	13,224	901	0	0	3,451	17,576
2074	13,581	912	0	0	3,545	18,038
2075	13,948	923	0	0	3,642	18,513
2076	14,364	937	0	0	3,752	19,053
2077	14,711	946	0	0	3,844	19,501
2078	15,162	2,857	0	0	74,796	92,815
2079	21,884	2,412	20	27,363	22,491	74,170
Totals	1,499,377	289,795	8,361	461,739	310,402	2,569,674

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 2 DECON Cash Flows by Category - Decommissioning After 60 Year Operation License Termination Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2049	120,422	4,296	1,172	198	26,916	153,004
2050	152,873	23,606	1,983	55,031	15,726	249,219
2051	157,925	33,798	1,300	111,993	19,073	324,089
2052	168,841	24,802	1,166	97,129	15,235	307,173
2053	177,376	18,299	1,069	86,405	12,432	295,581
2054	153,803	18,154	888	72,834	23,760	269,439
2055	94,626	6,213	351	10,786	11,114	123,090
2056	98	0	0	0	843	941
2057	100	0	0	0	863	963
2058	67	0	0	0	576	643
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	550	1,834	0	0	70,918	73,302
2079	5,751	497	0	27,363	19,827	53,438
Totals	1,032,432	131,499	7,929	461,739	217,283	1,850,882

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 2 DECON Cash Flows by Category - Decommissioning After 60 Year Operation Spent Fuel Management Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2049	5,346	9,921	0	0	3,705	18,972
2050	7,728	14,133	0	0	3,962	25,823
2051	7,346	13,241	0	0	3,597	24,184
2052	6,520	11,586	0	0	3,705	21,811
2053	5,926	10,382	0	0	3,796	20,104
2054	8,792	9,634	0	0	2,656	21,082
2055	9,163	2,190	4	0	801	12,158
2056	8,233	410	151	0	1,173	9,967
2057	8,431	414	154	0	1,202	10,201
2058	8,728	534	102	0	1,608	10,972
2059	9,095	757	0	0	2,364	12,216
2060	9,366	769	0	0	2,435	12,570
2061	9,593	776	0	0	2,495	12,864
2062	9,853	786	0	0	2,563	13,202
2063	10,120	796	0	0	2,633	13,549
2064	10,422	808	0	0	2,712	13,942
2065	10,675	816	0	0	2,779	14,270
2066	10,965	826	0	0	2,855	14,646
2067	11,262	836	0	0	2,934	15,032
2068	11,600	849	0	0	3,022	15,471
2069	11,883	857	0	0	3,097	15,837
2070	12,205	868	0	0	3,182	16,255
2071	12,535	879	0	0	3,269	16,683
2072	12,910	892	0	0	3,368	17,170
2073	13,224	901	0	0	3,451	17,576
2074	13,581	912	0	0	3,545	18,038
2075	13,948	923	0	0	3,642	18,513
2076	14,364	937	0	0	3,752	19,053
2077	14,711	946	0	0	3,844	19,501
2078	14,612	1,023	0	0	3,878	19,513
2079	0	0	0	0	222	222
Totals	313,137	89,602	411	0	88,247	491,397

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Unit 2 DECON Cash Flows by Category - Decommissioning After 60 Year Operation Site Restoration Costs - Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2049	563	0	0	0	0	563
2050	2,800	52	0	0	0	2,852
2051	4,776	133	0	0	0	4,909
2052	5,790	750	0	0	0	6,540
2053	6,556	1,194	0	0	0	7,750
2054	5,491	760	0	0	0	6,251
2055	1,988	719	0	0	26	2,733
2056	40,529	23,628	0	0	888	65,045
2057	41,505	23,857	0	0	910	66,272
2058	27,675	15,685	0	0	607	43,967
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	16,133	1,915	20	0	2,441	20,509
Totals	153,806	68,693	20	0	4,872	227,391

Vogtle Electric Generating Plant
2018 Escalation Analysis

ESCALATION ANALYSIS OF CASHFLOWS

Source Documentation:	Decommissioning Cost Study for the Vogtle Electric Generating Plant
Source Document Number:	S18-1754-002 Rev. 0
	[Summation of Unit 1 and Unit 2 values]
Unit Identification	Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Station
Estimate basis year:	2018
Decommissioning Scenario:	DECON
Operating Lifetime	Decommissioning After 60 Year Operation

Single Value Escalation % by Major Cost Categories				
Single value escalations: Cost Category	Single-value Yearly Escal.	Total Costs		
		2018 \$	Escnlated \$	
Total Costs	2.702%	1,842,977	4,881,296	
License Termination Costs	2.857%	1,314,482	3,451,974	
Spent Fuel Management Costs	2.492%	354,691	1,010,896	
Site Restoration Costs	2.242%	173,804	418,423	
Labor Costs	2.788%	1,043,190	2,830,932	
Equipment & Material Costs	1.217%	357,092	547,020	
Energy Costs	2.208%	8,060	16,466	
LLRW Disposal Costs	3.820%	231,319	835,385	
Other Costs	2.803%	203,317	651,493	

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Station DECON Cash Flows by Category - Decommissioning After 60 Year Operation Total Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	147,574	17,073	1,216	198	61,512	227,573
2048	166,668	45,176	1,918	55,648	19,708	289,118
2049	288,258	63,682	2,444	98,999	52,584	505,967
2050	302,501	69,685	3,113	129,248	37,028	541,575
2051	298,510	69,987	2,353	173,952	37,742	582,544
2052	285,402	56,732	1,984	151,599	48,947	544,664
2053	201,183	30,320	1,082	86,657	19,231	338,473
2054	179,679	28,997	899	73,062	29,525	312,162
2055	182,623	12,313	591	10,978	15,896	222,401
2056	92,930	40,966	307	0	5,819	140,022
2057	95,180	41,365	312	0	5,962	142,819
2058	69,696	27,719	207	0	5,595	103,217
2059	18,236	1,512	0	0	4,740	24,488
2060	18,781	1,535	0	0	4,883	25,199
2061	19,239	1,550	0	0	5,004	25,793
2062	19,763	1,569	0	0	5,141	26,473
2063	20,300	1,589	0	0	5,283	27,172
2064	20,909	1,613	0	0	5,443	27,965
2065	21,420	1,629	0	0	5,577	28,626
2066	22,004	1,649	0	0	5,731	29,384
2067	22,605	1,670	0	0	5,889	30,164
2068	23,285	1,695	0	0	6,068	31,048
2069	23,855	1,711	0	0	6,219	31,785
2070	24,505	1,733	0	0	6,390	32,628
2071	25,171	1,754	0	0	6,566	33,491
2072	25,926	1,781	0	0	6,765	34,472
2073	26,559	1,798	0	0	6,932	35,289
2074	27,281	1,820	0	0	7,123	36,224
2075	28,021	1,843	0	0	7,319	37,183
2076	28,859	1,871	0	0	7,541	38,271
2077	29,560	1,889	0	0	7,727	39,176
2078	30,468	5,702	0	0	150,390	186,560
2079	43,981	5,092	40	55,044	45,213	149,370
Totals	2,830,932	547,020	16,466	835,385	651,493	4,881,296

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Station DECON Cash Flows by Category - Decommissioning After 60 Year Operation License Termination Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	140,948	6,991	1,216	198	38,132	187,485
2048	152,281	24,944	1,918	55,648	15,124	249,915
2049	269,808	37,031	2,444	98,999	45,459	453,741
2050	281,735	45,061	3,113	129,248	29,552	488,709
2051	277,271	49,428	2,353	173,952	30,534	533,538
2052	263,725	39,099	1,984	151,599	42,905	499,312
2053	182,885	18,638	1,082	86,657	14,676	303,938
2054	159,421	18,496	899	73,062	26,092	277,970
2055	162,778	8,521	582	10,978	14,238	197,097
2056	328	0	0	0	1,690	2,018
2057	336	0	0	0	1,731	2,067
2058	224	0	0	0	1,155	1,379
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	1,104	3,659	0	0	142,591	147,354
2079	11,558	992	0	55,044	39,857	107,451
Totals	1,904,402	252,860	15,591	835,385	443,736	3,451,974

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Station DECON Cash Flows by Category - Decommissioning After 60 Year Operation Spent Fuel Management Costs - Thousands of Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	5,286	10,081	0	0	23,380	38,747
2048	10,743	20,183	0	0	4,584	35,510
2049	14,340	26,544	0	0	7,125	48,009
2050	13,040	23,786	0	0	7,477	44,303
2051	10,723	19,277	0	0	7,208	37,208
2052	12,208	16,244	0	0	6,042	34,494
2053	11,729	10,489	0	0	4,555	26,773
2054	14,756	9,742	0	0	3,433	27,931
2055	16,814	2,583	9	0	1,606	21,012
2056	16,503	819	307	0	2,352	19,981
2057	16,902	827	312	0	2,409	20,450
2058	17,497	1,068	207	0	3,225	21,997
2059	18,236	1,512	0	0	4,740	24,488
2060	18,781	1,535	0	0	4,883	25,199
2061	19,239	1,550	0	0	5,004	25,793
2062	19,763	1,569	0	0	5,141	26,473
2063	20,300	1,589	0	0	5,283	27,172
2064	20,909	1,613	0	0	5,443	27,965
2065	21,420	1,629	0	0	5,577	28,626
2066	22,004	1,649	0	0	5,731	29,384
2067	22,605	1,670	0	0	5,889	30,164
2068	23,285	1,695	0	0	6,068	31,048
2069	23,855	1,711	0	0	6,219	31,785
2070	24,505	1,733	0	0	6,390	32,628
2071	25,171	1,754	0	0	6,566	33,491
2072	25,926	1,781	0	0	6,765	34,472
2073	26,559	1,798	0	0	6,932	35,289
2074	27,281	1,820	0	0	7,123	36,224
2075	28,021	1,843	0	0	7,319	37,183
2076	28,859	1,871	0	0	7,541	38,271
2077	29,560	1,889	0	0	7,727	39,176
2078	29,363	2,042	0	0	7,798	39,203
2079	0	0	0	0	447	447
Totals	636,183	175,896	835	0	197,982	1,010,896

Financial Escalation Analysis-2018 Update-Vogtle Electric Generating Plant - Station DECON Cash Flows by Category - Decommissioning After 60 Year Operation Site Restoration Costs - Year of Expenditure Dollars						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals
2047	1,340	0	0	0	0	1,340
2048	3,644	49	0	0	0	3,693
2049	4,111	107	0	0	0	4,218
2050	7,726	838	0	0	0	8,564
2051	10,516	1,282	0	0	0	11,798
2052	9,468	1,389	0	0	0	10,857
2053	6,569	1,193	0	0	0	7,762
2054	5,502	760	0	0	0	6,262
2055	3,031	1,209	0	0	52	4,292
2056	76,100	40,147	0	0	1,777	118,024
2057	77,942	40,537	0	0	1,821	120,300
2058	51,974	26,651	0	0	1,215	79,840
2059	0	0	0	0	0	0
2060	0	0	0	0	0	0
2061	0	0	0	0	0	0
2062	0	0	0	0	0	0
2063	0	0	0	0	0	0
2064	0	0	0	0	0	0
2065	0	0	0	0	0	0
2066	0	0	0	0	0	0
2067	0	0	0	0	0	0
2068	0	0	0	0	0	0
2069	0	0	0	0	0	0
2070	0	0	0	0	0	0
2071	0	0	0	0	0	0
2072	0	0	0	0	0	0
2073	0	0	0	0	0	0
2074	0	0	0	0	0	0
2075	0	0	0	0	0	0
2076	0	0	0	0	0	0
2077	0	0	0	0	0	0
2078	0	0	0	0	0	0
2079	32,423	4,100	40	0	4,910	41,473
Totals	290,346	118,262	40	0	9,775	418,423

Table 3
DECON Vogtle Station
Decommissioning After 60 Year Operation