Southern Nuclear

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Docket Nos.: 72-36 72-42 72-1039

ATTN: Document Control Desk
Director, Division of Spent Fuel Management
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant – Units 1 and 2
Edwin I. Hatch Nuclear Plant – Units 1 and 2
Vogtle Electric Generating Plant – Units 1 and 2
Independent Spent Fuel Storage Installation
ISFSI Decommissioning Funding Plan Triennial Update

Ladies and Gentlemen:

In accordance with 10 CFR 72.30(c), Southern Nuclear Operating Company (SNC) hereby submits the enclosed Independent Spent Fuel Storage Installation (ISFSI) decommissioning funding plans for Joseph M. Farley Nuclear Plant (Farley) Units 1 and 2 (Docket 72-42), Edwin I. Hatch Nuclear Plant (Hatch) Units 1 and 2 (Docket 72-36), and Vogtle Electric Generating Plant (Vogtle) Units 1 and 2 (Docket 72-1039).

This letter contains no NRC commitments. If you have any questions or if additional information is needed, please contact Ryan Joyce at 205.992.6468.

Respectfully submitted,

R. Keith Brown
Regulatory Affairs Director

efb/cbg

Enclosures:
1. Farley ISFSI Decommissioning Funding Plan Triennial Update
2. Hatch ISFSI Decommissioning Funding Plan Triennial Update
3. Vogtle ISFSI Decommissioning Funding Plan Triennial Update

cc: NRC Director – Division of Spent Fuel Management
NRC Region II Regional Administrator
NRC NRR Project Manager – Farley, Hatch, and Vogtle
NRC Senior Resident Inspector – Farley, Hatch, and Vogtle
Alabama Power Company
Georgia Power Company
Oglethorpe Power Corporation
Municipal Electric Authority of Georgia
Dalton Utilities
SNC Document Control R-Type: PP1.006

Joseph M. Farley Nuclear Plant – Units 1 and 2
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Enclosure 1

Farley ISFSI Decommissioning Funding Plan Triennial Update

Joseph M. Farley Nuclear Plant – Units 1 and 2
ISFSI Decommissioning Funding Plan Triennial Update

Background and Introduction

The Nuclear Regulatory Commission (NRC) issued its final rule on Decommissioning Planning on June 17, 2011, with the rule becoming effective on December 17, 2012. Subpart 72.30, "Financial assurance and recordkeeping for decommissioning," requires that Southern Nuclear Operating Company (SNC) submit for NRC review and approval a decommissioning funding plan that demonstrates reasonable assurance that funds will be available to decommission the Independent Spent Fuel Storage Installation (ISFSI). In accordance with Subpart 72.30(b) and (c) of the rule, this enclosure provides the required triennial update, including a detailed cost estimate, with adjustments as necessary to account for changes in costs and site conditions.

Spent Fuel and ISFSI Management Strategy

The operating licenses for the Farley Nuclear Plant (Farley) Units 1 & 2 are currently set to expire on June 25, 2037 and March 31, 2041 respectively. Approximately 5,520 spent fuel assemblies are currently projected to be generated as a result of plant operations through the license expiration date. The Farley ISFSI is operated in accordance with the general license provisions of 10 CFR 72.210.

The spent fuel pools are assumed to contain approximately 1,340 spent fuel assemblies after the final core offloads. To facilitate immediate dismantling or safe-storage operations, the spent fuel that cannot be transferred directly to the DOE from the pool is assumed to be packaged in dry storage casks for interim storage at the ISFSI. Transferring the spent fuel from the pool to the ISFSI will permit decontamination and dismantling of the spent fuel pool systems and allow termination of the Part 50 license using the DECON method described in NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supp. 1.

Completion of the ISFSI decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor. The SNC spent fuel management plan for Farley assumes: 1) a 2032 start date for DOE initiating transfer of commercial spent fuel to a federal facility, and 2) completion of spent fuel receipt by year 2075. The completion date is based on DOE's allocation/receipt schedules with the oldest fuel receiving the highest priority. The end date assumes a maximum rate of transfer of 3,000 metric tons of uranium/year.

At the conclusion of the spent fuel transfer process, the ISFSI will be promptly decommissioned by removing and disposing of residual radioactivity and verifying that remaining materials satisfy NRC release criteria.

ISFSI Description

The Farley ISFSI uses a Holtec International (Holtec) HI-STORM 100 dry storage system. The HI-STORM 100 is comprised of a multi-purpose canister (MPC) and storage overpack. The MPCs are assumed to be transferred directly to the DOE and not returned to the station. Some of the

remaining overpacks are assumed to have residual radioactivity due to neutron-induced activation resulting from long-term storage of the spent fuel.

SNC's current spent fuel management plan for Farley spent fuel would result in 123 spent fuel storage casks (32 assemblies per cask) being placed on a storage pad at the site after all spent fuel has been removed from the spent fuel pool. This represents approximately 71% of the total spent fuel projected to be generated during the currently licensed operating period. The balance of the fuel assemblies is assumed to have been transferred directly to the DOE from the Farley spent fuel pools.

In addition to the spent fuel casks located on the ISFSI pad after shutdown there are projected to be additional casks used for Greater-than-Class-C (GTCC) storage. The storage overpacks used for the GTCC canisters (estimated quantity of 8) are not expected to have any interior contamination or residual activation and can be reused or disposed of by conventional means after a final status survey.

Table 1 provides the significant quantities and physical dimensions used as the basis in developing the ISFSI decommissioning cost estimate.

Key Assumptions / Estimating Approach

The decommissioning estimate is based on the configuration of the ISFSI expected after all spent fuel and GTCC material has been removed from the site. The size of the ISFSI pad is sufficient to store the projected amount of spent fuel and is assumed to be 44,935 square feet in surface area.

Some of the inner steel-liners of the HI-STORM concrete overpacks, 10 of the 123 total, are assumed to contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. The estimate is based upon the number of casks required for the final core off-load (i.e., 157 offloaded assemblies, 32 assemblies per cask) which results in 5 overpacks per unit. It is assumed that these are the final overpacks to be emptied of their spent fuel casks because the DOE plans to dispose of the oldest fuel first. These final 10 overpacks are assumed to be disposed of before sufficient time has elapsed for radioactive decay of the neutron activation products.

This analysis assumes that good radiological practices are employed, and there will be no residual contamination left on the concrete ISFSI pad or other facilities at the Farley ISFSI. Consequently, only verification surveys are assumed in the decommissioning estimate.

There is no expected subsurface material in the proximity of the ISFSI containing residual radioactivity that will require remediation to meet the criteria for license termination.

Decommissioning is assumed to be performed by an independent contractor. As such, essentially all labor, equipment, and material costs are based on national averages, i.e., costs from national publications such as RSMeans Building Construction Cost Data (adjusted for regional variations), and laboratory service costs are based on vendor price lists. The estimate includes labor and overhead for SNC oversight of the contractor, SNC security, and other site operating costs.

Low-level radioactive waste disposal costs are based on SNC's current cost of disposal at the Energy*Solutions* Clive, Utah disposal site.

Costs are reported in 2022 dollars. Consistent with NUREG-1757, a 25% contingency has been added. The estimate is limited to costs necessary to terminate the ISFSI license and meet the §20.1402 criteria for unrestricted use. Disposition of released material and structures is outside the scope of the estimate.

In accordance with 10 CFR 72.30(c)(1)-(4), the following have been specifically considered in the decommissioning cost estimate:

(1) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material: There have been no spills at the Farley ISFSI.

(2) Facility modifications: There have been two additional spent fuel storage pads added to the ISFSI since the previous report. They have been accounted for in this decommissioning cost estimate.

(3) Changes in authorized possession limits: There are no changes in authorized possession limits that affect the decommissioning cost estimate.

(4) Actual remediation costs that exceed the previous cost estimate: No actual remediation costs have been incurred; therefore, no actual remediation costs exceed the previous cost estimate.

All expenditures are conservatively assumed to be incurred in the year 2076, the year following all spent fuel removal.

Cost Estimate and Financial Assurance Certification

The estimated cost to decommission the Farley ISFSI and release the facility for unrestricted use is provided in Table 2. The estimate for ISFSI decommissioning is $12,607,000 (2022$) shared by both operating units.

As shown in Table 3, adequate funds for decommissioning of the Farley ISFSI are assured by the same external sinking fund method used for the nuclear decommissioning trust (NDT) fund established for each unit in accordance with 10 CFR 50.75. The Farley NDTs are maintained and adjusted as necessary to ensure that the total amount of funds is sufficient to pay the ISFSI decommissioning costs. Funds in excess of the amount required for decommissioning the Part 50 facility provide adequate assurance that funding for decommissioning the ISFSI will be available upon expiration of the Part 50 operating licenses.

Table 1
Significant Quantities and Physical Dimensions

Item	Area (ft^2)	Notes
ISFSI Pad	44,935	No residual radioactivity

ISFSI Overpack (HI-STORM 100)

Item	Value	Notes
Overall Height (inches)	218.0	
Outside Diameter (inches)	132.0	
Inside Diameter (inches)	73.5	
Inner Liner Thickness (inches)	1.25	
Quantity (total)	131	Spent Fuel 123 + GTCC 8
Quantity (with residual radioactivity)	10	The number of overpacks used to store the last complete core offloads
Total Surface Area of Overpack Inner Liner with Residual Radioactivity (square feet)	3,167	
Low-Level Radioactive Waste (cubic feet)	51,369	
Low-Level Radioactive Waste (packaged density- lbs./cu.ft.)	55	

Other Potentially Impacted Items

Item	Value	Notes
Number of Overpacks used for GTCC storage	8	No residual radioactivity
Transfer Cask	1	No residual radioactivity

Table 2
ISFSI Decommissioning Costs and Waste Volumes

	(thousands, 2022 dollars)						Waste Volume	Person-Hours		
	Removal	Packaging	Transport	Disposal	Other	Total	(ft3)	Contractor	Licensee	NRC
Decommissioning Contractor										
Planning (characterization, specs and procedures)	-	-	-	-	451	451	-	1,216		
Remediation (activated liner removal)	305	247	2,229	2,782		5,562	51,369	2,991	-	
License Termination (radiological surveys)	-	-	-	-	2,548	2,548	-	16,706	-	
Subtotal	**305**	**247**	**2,229**	**2,782**	**2,999**	**8,561**	**51,369**	**20,914**	-	
Supporting Costs										
NRC and NRC Contractor Fees and Costs					541	541				1,153
Insurance					87	87				
Property Tax					2	2				
Plant Energy Budget					4	4				
Site Overhead					25	25				
Corporate Overheads					134	134				
Security Staff Cost					337	337			4,958	
Utility Staff Cost					395	395			3,761	
Subtotal					**1,524**	**1,524**			**8,719**	
Total (w/o contingency)	**305**	**247**	**2,229**	**2,782**	**4,523**	**10,085**	**51,369**	**20,914**	**8,719**	**1,153**
Total (*with 25%* contingency)						**12,606**				

Table 3 – Financial Assurance – Alabama Power Company

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$551,654,000	$551,654,000
2	Total amount accumulated in the trust fund at the end of 2022	$569,506,402	$555,749,283
3	Assumptions regarding:		
	(a) Rates of escalation in decommissioning costs	4.5%	4.5%
	(b) Rates of earnings on decommissioning funds	7.0%	7.0%
	(c) Real rate of return	2.5%	2.5%
4	Projected ending fund balance (U1 – year 2037, U2 year 2041)	$1,529,342,556	$1,924,720,205
5	Projected NRC minimum requirements (U1 - year 2037, U2 - year 2041)	$1,067,606,301	$1,273,140,372
6	Surplus funds available for decommissioning for U1 in 2037 and Unit 2 in 2041.	$461,736,255	$651,579,833
7	ISFSI decommissioning cost study estimate (2022$)	$6,305,000	$6,301,000
8	Projected ISFSI decommissioning cost estimate (U1 – year 2037, U2 – year 2041)	$12,202,000	$14,542,000

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

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Enclosure 2

Hatch ISFSI Decommissioning Funding Plan Triennial Update

Edwin I. Hatch Nuclear Plant – Units 1 and 2
ISFSI Decommissioning Funding Plan Triennial Update

Background and Introduction

The Nuclear Regulatory Commission (NRC) issued its final rule on Decommissioning Planning on June 17, 2011, with the rule becoming effective on December 17, 2012. Subpart 72.30, "Financial assurance and recordkeeping for decommissioning," requires that Southern Nuclear Operating Company (SNC) submit for NRC review and approval a decommissioning funding plan that demonstrates reasonable assurance that funds will be available to decommission the Independent Spent Fuel Storage Installation (ISFSI). In accordance with Subpart 72.30(b) and (c) of the rule, this enclosure provides the required triennial update, including a detailed cost estimate, with adjustments as necessary to account for changes in costs and site conditions.

Spent Fuel and ISFSI Management Strategy

The operating licenses for the Hatch Nuclear Plant (Hatch) Units 1 & 2 are currently set to expire on August 6, 2034 and June 13, 2038 respectively. Approximately 14,823 spent fuel assemblies are currently projected to be generated as a result of plant operations through the license expiration date. The Hatch ISFSI is operated in accordance with the general license provisions of 10 CFR 72.210.

The spent fuel pools are assumed to contain approximately 4,156 spent fuel assemblies after the final core offloads. To facilitate immediate dismantling or safe-storage operations, the spent fuel that cannot be transferred directly to the DOE from the pool is assumed to be packaged in dry storage casks for interim storage at the ISFSI. Transferring the spent fuel from the pool to the ISFSI will permit decontamination and dismantling of the spent fuel pool systems and allow termination of the Part 50 license using the DECON method described in NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supp. 1.

Completion of the ISFSI decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order in which it was discharged from the reactor. The SNC spent fuel management plan for Hatch assumes: 1) a 2032 start date for DOE initiating transfer of commercial spent fuel to a federal facility, and 2) completion of spent fuel receipt by year 2074. The completion date is based on DOE's allocation/receipt schedules with the oldest fuel receiving the highest priority. The end date assumes a maximum rate of transfer of 3,000 metric tons of uranium/year.

At the conclusion of the spent fuel transfer process, the ISFSI will be promptly decommissioned by removing and disposing of residual radioactivity and verifying that remaining materials satisfy NRC release criteria.

ISFSI Description

The Hatch ISFSI uses a Holtec International (Holtec) HI-STORM 100 dry storage system. The HI-STORM 100 is comprised of a multi-purpose canister (MPC) and storage overpack. The MPCs

are assumed to be transferred directly to the DOE and not returned to the station. Some of the remaining overpacks are assumed to have residual radioactivity due to neutron-induced activation resulting from long-term storage of the spent fuel.

SNC's current spent fuel management plan for Hatch spent fuel would result in 138 spent fuel storage casks (68 assemblies per cask) and 39 spent fuel storage casks (52 assemblies per cask) being placed on a storage pad at the site after all spent fuel has been removed from the spent fuel pool. This represents approximately 77% of the total spent fuel projected to be generated during the currently licensed operating period. The balance of the fuel assemblies is assumed to have been transferred directly to the DOE from the Hatch spent fuel pools.

In addition to the spent fuel casks located on the ISFSI pad after shutdown there are projected to be additional casks used for Greater-than-Class-C (GTCC) storage. The storage overpacks used for the GTCC canisters (estimated quantity of 6) are not expected to have any interior contamination or residual activation and can be reused or disposed of by conventional means after a final status survey.

Table 1 provides the significant quantities and physical dimensions used as the basis in developing the ISFSI decommissioning cost estimate.

Key Assumptions / Estimating Approach

The decommissioning estimate is based on the configuration of the ISFSI expected after all spent fuel and GTCC material has been removed from the site. The size of the ISFSI pad is sufficient to store the projected amount of spent fuel and is assumed to be 48,500 square feet in surface area.

Some of the inner steel-liners of the HI-STORM concrete overpacks, 22 of the 177 total, are assumed to contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. The estimate is based upon the number of casks required for the final core off-load (i.e., 560 offloaded assemblies, 52 assemblies per cask) which results in 11 overpacks per unit. It is assumed that these are the final overpacks to be emptied of their spent fuel casks because the DOE plans to dispose of the oldest fuel first. These final 22 overpacks are assumed to be disposed of before sufficient time has elapsed for radioactive decay of the neutron activation products.

This analysis assumes that good radiological practices are employed, and there will be no residual contamination left on the concrete ISFSI pad or other facilities at the Hatch ISFSI. Consequently, only verification surveys are assumed in the decommissioning estimate.

There is no expected subsurface material in the proximity of the ISFSI containing residual radioactivity that will require remediation to meet the criteria for license termination.

Decommissioning is assumed to be performed by an independent contractor. As such, essentially all labor, equipment, and material costs are based on national averages, i.e., costs from national publications such as RSMeans Building Construction Cost Data (adjusted for regional variations), and laboratory service costs are based on vendor price lists. The estimate includes labor and overhead for SNC oversight of the contractor, SNC security, and other site operating costs.

Low-level radioactive waste disposal costs are based on SNC's current cost of disposal at the Energy*Solutions* Clive, Utah disposal site.

Costs are reported in 2022 dollars. Consistent with NUREG-1757, a 25% contingency has been added. The estimate is limited to costs necessary to terminate the ISFSI license and meet the §20.1402 criteria for unrestricted use. Disposition of released material and structures is outside the scope of the estimate.

In accordance with 10 CFR 72.30(c)(1)-(4), the following have been specifically considered in the decommissioning cost estimate:

(1) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material: There have been no spills at the Hatch ISFSI.

(2) Facility modifications: There have been no facility modifications in the past three years that affect the decommissioning cost estimate.

(3) Changes in authorized possession limits: There are no changes in authorized possession limits that affect the decommissioning cost estimate.

(4) Actual remediation costs that exceed the previous cost estimate: No actual remediation costs have been incurred; therefore, no actual remediation costs exceed the previous cost estimate.

All expenditures are conservatively assumed to be incurred in the year 2075, the year following all spent fuel removal.

Cost Estimate and Financial Assurance Certification

The estimated cost to decommission the Hatch ISFSI and release the facility for unrestricted use is provided in Table 2. The estimate for ISFSI decommissioning is $20,453,000 (2022$) shared by both operating units.

As shown in Table 3, adequate funds for decommissioning of the Hatch ISFSI are assured by the same external sinking fund method used for the nuclear decommissioning trust (NDT) fund established for each unit in accordance with 10 CFR 50.75. The Hatch NDTs are maintained and adjusted as necessary to ensure that the total amount of funds is sufficient to pay the ISFSI decommissioning costs. Funds in excess of the amount required for decommissioning the Part 50 facility provide adequate assurance that funding for decommissioning the ISFSI will be available upon expiration of the Part 50 operating licenses.

Table 1
Significant Quantities and Physical Dimensions

Item	Area (ft^2)	Notes
ISFSI Pad	47,816	No residual radioactivity

ISFSI Overpack (HI-STORM 100)

Item	Value	Notes (all dimensions are nominal)
Overall Height (inches)	229.0	
Outside Diameter (inches)	132.0	
Inside Diameter (inches)	73.5	
Inner Liner Thickness (inches)	1.25	
Quantity (total)	183	Spent Fuel 177 + GTCC 6
Quantity (with residual radioactivity)	22	The number of overpacks used to store the last complete core offloads
Total Surface Area of Overpack Inner Liner with Residual Radioactivity (square feet)	7,368	
Low-Level Radioactive Waste (cubic feet)	112,085	
Low-Level Radioactive Waste (packaged density- lbs./cu.ft.)	54	

Other Potentially Impacted Items

Item	Value	Notes
Number of Overpacks used for GTCC storage	6	No residual radioactivity
Transfer Cask	1	No residual radioactivity

Table 2
ISFSI Decommissioning Costs and Waste Volumes

	(thousands, 2022 dollars)						Waste Volume	Person-Hours		
	Removal	Packaging	Transport	Disposal	Other	Total	(ft3)	Contractor	Licensee	NRC/ NRC Contractor
Decommissioning Contractor										
Planning (characterization, specs and procedures)					522	522			1,288	
Remediation (activated liner removal)	641	581	4,052	6,616		11,891	112,085	6,710		
License Termination (radiological surveys)					2,043	2,043		16,522		
Subtotal	**641**	**581**	**4,052**	**6,616**	**3,079**	**14,970**	**112,085**	**23,363**	**1,288**	
Supporting Costs										
NRC and NRC Contractor Fees and Costs					585	585				1,153
Insurance					92	92				
Property Tax					0	0				
Plant Energy Budget					4	4				
Security (Industrial)					277	277			4,999	
Hatch Oversight Staff					434	434			3,792	
Subtotal	0	0	0	0	**1,392**	**1,392**	0	0	**8,792**	1,153
Total (w/o contingency)	**641**	**581**	**4,052**	**6,616**	**4,472**	**16,362**	**112,085**	**23,363**	**10,080**	**1,153**
Total (*with 25%* contingency)						**20,453**				

Table 3 – Financial Assurance - Georgia Power Company
(50.1% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$338,857,303	$338,857,303
2	Total amount accumulated in the trust fund at the end of 2022	$320,848,000	$304,261,000
3	Assumptions regarding: (a) Rates of escalation in decommissioning costs (b) Rates of earnings on decommissioning funds (c) Real rate of return	 2.78% 4.78% 2.00%	 2.77% 4.77% 2.00%
4	Projected fund balance (U1 – year 2034, U2 year 2038)	$569,014,000	$641,881,000
5	Projected NRC minimum requirements (U1 - year 2034, U2 - year 2038)	$470,891,000	$524,661,000
6	Surplus funds available for decommissioning for U1 in 2034 and Unit 2 in 2038.	$98,124,000	$117,220,000
7	ISFSI decommissioning cost study estimate (2022$)	$5,123,477	$5,123,476
8	Projected ISFSI decommissioning cost estimate (U1 – year 2034, U2 – year 2038)	$7,111,498	$7,932,798

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

Table 4 – Financial Assurance - Oglethorpe Power Corporation
(30% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$202,908,584	$202,908,584
2	Total amount accumulated in the trust fund at the end of 2022	$186,156,225	$146,351,765
3	Assumptions regarding: (a) Rates of escalation in decommissioning costs (b) Rates of earnings on decommissioning funds (c) Real rate of return	 2.776% 4.776% 2.00%	 2.771% 4.771% 2.00%
4	Projected ending fund balance (U1 – year 2034, U2 year 2038)	$325,851,209	$308,500,158
5	Projected NRC minimum requirements (U1 - year 2034, U2 - year 2038)	$281,839,490	$314,217,688
6	Deficit/Surplus funds projected to be accumulated at license termination.	$44,011,719	<5,717,530>
7	Surplus funds available for decommissioning the Hatch station	$38,294,189	
8	ISFSI decommissioning cost study estimate (2022$)	$6,135,900	
9	Projected ISFSI decommissioning cost estimate (U1 – year 2034, U2 – year 2038)	$8,490,539	

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

Table 5 – Financial Assurance - Municipal Electric Authority of Georgia
(17.7% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$119,716,053	$119,716,053
2	Total amount accumulated in the trust fund at the end of 2022	$143,314,311	$142,792,198
3	Assumptions regarding: (a) Rates of escalation in decommissioning costs	2.50%	2.50%
	(b) Rates of earnings on decommissioning funds	4.22%	4.22%
	(c) Real rate of return	1.72%	1.72%
4	Projected ending fund balance (U1 – year 2034, U2 year 2038)	$246,037,000	$276,096,000
5	Projected NRC minimum requirements (U1 - year 2034, U2 - year 2038)	$161,004,782	$177,719,154
6	Surplus funds available for decommissioning for U1 in 2034 and Unit 2 in 2038.	$85,032,218	$98,376,846
7	ISFSI decommissioning cost study estimate (2022$)	$1,810,091	$1,810,090
8	Projected ISFSI decommissioning cost estimate (U1 – year 2034, U2 – year 2038)	$2,434,371	$2,687,089

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

Table 6 – Financial Assurance - Dalton Utilities
(2.2% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$14,879,961	$14,879,961
2	Total amount accumulated in the trust fund at the end of 2022.	$12,796,824	$13,212,283
3	Assumptions regarding:		
	(a) Rates of escalation in decommissioning costs	2.78%	2.77%
	(b) Rates of earnings on decommissioning funds	5.00%	5.00%
	(c) Real rate of return	2.22%	2.23%
4	Projected ending fund balance (U1 – year 2035, U2 year 2039)	$25,455,833	$31,893,965
5	Projected NRC minimum requirements (U1 - year 2034, U2 - year 2038)	$20,677,839	$23,038,993
6	Surplus funds available for decommissioning the ISFSI U1 in 2035 and Unit 2 in 2039.	$4,777,994	$8,854,972
7	ISFSI decommissioning cost study estimate (2022$)	$224,983	$224,983
8	Projected ISFSI decommissioning cost estimate (U1 – year 2034, U2 – year 2038)	$312,646	$348,346

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

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Enclosure 3

Vogtle ISFSI Decommissioning Funding Plan Triennial Update

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ISFSI Decommissioning Funding Plan Triennial Update

Background and Introduction

The Nuclear Regulatory Commission (NRC) issued its final rule on Decommissioning Planning on June 17, 2011, with the rule becoming effective on December 17, 2012. Subpart 72.30, "Financial assurance and recordkeeping for decommissioning," requires that Southern Nuclear Operating Company (SNC) submit for NRC review and approval a decommissioning funding plan that demonstrates reasonable assurance that funds will be available to decommission the Independent Spent Fuel Storage Installation (ISFSI). In accordance with Subpart 72.30(b) and (c) of the rule, this enclosure provides the required triennial update, including a detailed cost estimate, with adjustments as necessary to account for changes in costs and site conditions.

Spent Fuel and ISFSI Management Strategy

The operating licenses for the Vogtle Electric Generating Plant (Vogtle) Units 1 & 2 are currently set to expire on January 16, 2047 and February 9, 2049 respectively. Approximately 7,156 spent fuel assemblies are currently projected to be generated as a result of plant operations through the license expiration date. The Vogtle ISFSI is operated in accordance with the general license provisions of 10 CFR 72.210.

The spent fuel pools are assumed to contain a total of approximately 2,409 spent fuel assemblies after the final core offloads. To facilitate immediate dismantling or safe-storage operations, the spent fuel that cannot be transferred directly to the DOE from the pool is assumed to be packaged in dry storage casks for interim storage at the ISFSI. Transferring the spent fuel from the pool to the ISFSI will permit decontamination and dismantling of the spent fuel pool systems and allow termination of the Part 50 license using the DECON method described in NUREG-0586, Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supp. 1.

Completion of the ISFSI decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor. The SNC spent fuel management plan for Vogtle assumes: 1) a 2032 start date for DOE initiating transfer of commercial spent fuel to a federal facility, and 2) completion of spent fuel receipt by year 2078. The completion date is based on DOE's allocation/receipt schedules with the oldest fuel receiving the highest priority. The end date assumes a maximum rate of transfer of 3,000 metric tons of uranium/year.

At the conclusion of the spent fuel transfer process, the ISFSI will be promptly decommissioned by removing and disposing of residual radioactivity and verifying that remaining materials satisfy NRC release criteria.

ISFSI Description

The Vogtle ISFSI uses a Holtec International (Holtec) HI-STORM 100 dry storage system. The HI-STORM 100 is comprised of a multi-purpose canister (MPC) and storage overpack. The MPCs are assumed to be transferred directly to the DOE and not returned to the station. Some of the

remaining overpacks are assumed to have residual radioactivity due to neutron-induced activation resulting from long-term storage of the spent fuel.

SNC's current spent fuel management plan for Vogtle spent fuel would result in 93 spent fuel storage casks (32 assemblies per cask) and 78 spent fuel storage casks (24 assemblies per cask) being placed on a storage pad at the site after all spent fuel has been removed from the spent fuel pool. This represents approximately 67% of the total spent fuel projected to be generated during the currently licensed operating period. The balance of the fuel assemblies is assumed to have been transferred directly to the DOE from the Vogtle spent fuel pools.

In addition to the spent fuel casks located on the ISFSI pad after shutdown there are projected to be additional casks used for Greater-than-Class-C (GTCC) storage. The storage overpacks used for the GTCC canisters (estimated quantity of 10) are not expected to have any interior contamination or residual activation and can be reused or disposed of by conventional means after a final status survey.

Table 1 provides the significant quantities and physical dimensions used as the basis in developing the ISFSI decommissioning cost estimate.

Key Assumptions / Estimating Approach

The decommissioning estimate is based on the configuration of the ISFSI expected after all spent fuel and GTCC material has been removed from the site. The size of the ISFSI pad is sufficient to store the projected amount of spent fuel and is assumed to be 53,309 square feet in surface area.

Some of the inner steel-liners of the HI-STORM concrete overpacks, 18 of the 171 total, are assumed to contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. The estimate is based upon the number of casks required for the final core off-load (i.e., 193 offloaded assemblies, 24 assemblies per cask) which results in 9 overpacks per unit. It is assumed that these are the final overpacks to be emptied of their spent fuel casks because the DOE plans to dispose of the oldest fuel first. These final 18 overpacks are assumed to be disposed of before sufficient time has elapsed for radioactive decay of the neutron activation products.

This analysis assumes that good radiological practices are employed, and there will be no residual contamination left on the concrete ISFSI pad or other facilities at the Vogtle ISFSI. Consequently, only verification surveys are assumed in the decommissioning estimate.

There is no expected subsurface material in the proximity of the ISFSI containing residual radioactivity that will require remediation to meet the criteria for license termination.

Decommissioning is assumed to be performed by an independent contractor. As such, essentially all labor, equipment, and material costs are based on national averages, i.e., costs from national publications such as RSMeans Building Construction Cost Data (adjusted for regional variations), and laboratory service costs are based on vendor price lists. The estimate includes labor and overhead for SNC oversight of the contractor, SNC security, and other site operating costs.

Low-level radioactive waste disposal costs are based on SNC's current cost of disposal at the Energy*Solutions* Clive, Utah disposal site.

Costs are reported in 2022 dollars. Consistent with NUREG-1757, a 25% contingency has been added. The estimate is limited to costs necessary to terminate the ISFSI license and meet the §20.1402 criteria for unrestricted use. Disposition of released material and structures is outside the scope of the estimate.

In accordance with 10 CFR 72.30(c)(1)-(4), the following have been specifically considered in the decommissioning cost estimate:

(1) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material: There have been no spills at the Vogtle ISFSI.

(2) Facility modifications: There have been no facility modifications in the past three years that affect the decommissioning cost estimate.

(3) Changes in authorized possession limits: There are no changes in authorized possession limits that affect the decommissioning cost estimate.

(4) Actual remediation costs that exceed the previous cost estimate: No actual remediation costs have been incurred; therefore, no actual remediation costs exceed the previous cost estimate.

All expenditures are conservatively assumed to be incurred in the year 2079, the year following all spent fuel removal.

Cost Estimate and Financial Assurance Certification

The estimated cost to decommission the Vogtle ISFSI and release the facility for unrestricted use is provided in Table 2. The estimate for ISFSI decommissioning is $17,827,000 (2022$) shared by both operating units.

As shown in Table 3, adequate funds for decommissioning of the Vogtle ISFSI are assured by the same external sinking fund method used for the nuclear decommissioning trust (NDT) fund established for each unit in accordance with 10 CFR 50.75. The Vogtle NDTs are maintained and adjusted as necessary to ensure that the total amount of funds is sufficient to pay the ISFSI decommissioning costs. Funds in excess of the amount required for decommissioning the Part 50 facility provide adequate assurance that funding for decommissioning the ISFSI will be available upon expiration of the Part 50 operating licenses.

Table 1
Significant Quantities and Physical Dimensions

Item	Area (ft^2)	Notes
ISFSI Pad	53,309	No residual radioactivity

ISFSI Overpack (HI-STORM 100)

Item	Value	Notes
Overall Height (inches)	218	
Outside Diameter (inches)	132	
Inside Diameter (inches)	73.5	
Inner Liner Thickness (inches)	1.25	
Quantity (total)	181	Spent Fuel 171 + GTCC 10
Quantity (with residual radioactivity)	18	The number of overpacks used to store the last complete core offloads
Total Surface Area of Overpack Inner Liner with Residual Radioactivity (square feet)	5,700	
Low-Level Radioactive Waste (cubic feet)	91,270	
Low-Level Radioactive Waste (packaged density- lbs./cu.ft.)	54	

Other Potentially Impacted Items

Item	Value	Notes
Number of Overpacks used for GTCC storage	10	No residual radioactivity
Transfer Cask	1	No residual radioactivity

Table 2
ISFSI Decommissioning Costs and Waste Volumes

	(thousands, 2022 dollars)						Waste Volume	Person-Hours		
	Removal	Packaging	Transport	Disposal	Other	Total	(ft3)	Contractor	Licensee	NRC/ NRC Contractor
Decommissioning Contractor										
Planning (characterization, specs and procedures)					544	544			1,312	
Remediation (activated liner removal)	527	427	3,267	5,367		9,587	91,270	5,359		
License Termination (radiological surveys)					2,778	2,778		18,468		
Subtotal	**527**	**427**	**3,267**	**5,367**	**3,322**	**12,909**	**91,270**	**23,827**	**1,312**	
Supporting Costs										
NRC and NRC Contractor Fees and Costs					588	588				1,153
Insurance					92	92				
Property Tax					0	0				
Plant Energy Budget					5	5				
Security Staff Cost					234	234			5,040	
Vogtle Oversight Staff					434	434			3,824	
Subtotal					**1,353**	**1,353**			**8,864**	**1,153**
Total (w/o contingency)	**527**	**427**	**3,267**	**5,367**	**4,675**	**14,262**	**91,270**	**23,827**	**10,176**	**1,153**
Total (*with 25%* contingency)						**17,827**				

Table 3 – Financial Assurance - Georgia Power Company
(45.7% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$265,175,556	$265,175,556
2	Total amount accumulated in the trust fund at the end of 2022	$175,273,000	$204,955,000
3	Assumptions regarding:		
	(a) Rates of escalation in decommissioning costs	2.70%	2.70%
	(b) Rates of earnings on decommissioning funds	4.70%	4.70%
	(c) Real rate of return	2.00%	2.00%
4	Projected ending fund balance (U1 – year 2047, U2 year 2049)	$592,805,000	$701,823,000
5	Projected NRC minimum requirements (U1 - year 2047, U2 - year 2049)	$516,172,161	$544,421,748
6	Surplus funds available for decommissioning for U1 in 2047 and Unit 2 in 2049.	$76,632,839	$157,401,252
7	ISFSI decommissioning cost study estimate (2022$)	$4,073,470	$4,073,469
8	Projected ISFSI decommissioning cost estimate (U1 – year 2047, U2 – year 2049)	$7,929,131	$8,363,083

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

Table 4 – Financial Assurance - Oglethorpe Power Corporation
(30% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$174,075,857	$174,075,857
2	Total amount accumulated in the trust fund at the end of 2022	$108,602,652	$98,375,539
3	Assumptions regarding: (a) Rates of escalation in decommissioning costs (b) Rates of earnings on decommissioning funds (c) Real rate of return	 2.697% 4.697% 2.00%	 2.703% 4.703% 2.00%
4	Projected ending fund balance (U1 – year 2047, U2 year 2049)	$342,134,106	$340,238,544
5	Projected NRC minimum requirements (U1 - year 2047, U2 - year 2049)	$338,596,782	$357,670,730
6	Deficit/Surplus funds projected to be accumulated at license termination.	$3,537,324	<$17,432,186>
7	Deficit of funds for decommissioning the Vogtle 1-2 station ISFSI Surplus of funds for decommissioning the Vogtle 1-2 station ISFSI.[1]	<13,894,862> as of 12/31/2022 24,214,871 as of 2/28/2023	
8	ISFSI decommissioning cost study estimate (2022$)	5,348,100	
9	Projected ISFSI decommissioning cost estimate (U1 – year 2047, U2 – year 2049)	9,976,352	

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy

[1] As demonstrated in the 2022 biennial 10 CFR 50.75 financial assurance report. (SNC Letter # NL-23-0014)

Table 5 – Financial Assurance - Municipal Electric Authority of Georgia
(22.7% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$131,718,000	$131,718,000
2	Total amount accumulated in the trust fund at the end of 2022	$143,295,406	$137,929,286
3	Assumptions regarding: (a) Rates of escalation in decommissioning costs	2.50%	2.50%
	(b) Rates of earnings on decommissioning funds	4.22%	4.22%
	(c) Real rate of return	1.72%	1.72%
4	Projected ending fund balance (U1 – year 2047, U2 year 2049)	$401,496,000	$444,574,000
5	Projected NRC minimum requirements (U1 - year 2047, U2 - year 2049)	$244,198,000	$256,561,000
6	Surplus funds available for decommissioning for U1 in 2047 and Unit 2 in 2049.	$157,298,000	$188,013,000
7	ISFSI decommissioning cost study estimate (2022$)	$2,023,365	$2,023,364
8	Projected ISFSI decommissioning cost estimate (U1 – year 2047, U2 – year 2049)	$3,751,206	$3,941,108

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.

Table 6 – Financial Assurance – Dalton Utilities
(1.6% Ownership)

		Unit 1	Unit 2
1	The NRC minimum decommissioning estimate	$9,284,046	$9,284,046
2	Total amount accumulated in the trust fund at the end of 2022	$7,414,151	$6,391,238
3	Assumptions regarding: (a) Rates of escalation in decommissioning costs (b) Rates of earnings on decommissioning funds (c) Real rate of return	 2.70% 5.00% 2.30%	 2.70% 5.00% 2.30%
4	Projected ending fund balance (U1 – year 2047, U2 year 2049)	$28,218,693	$28,791,302
5	Projected NRC minimum requirements pursuant to 10 CFR 50.75 (b) and (c) (U1 - year 2047, U2 - year 2049)	$18,071,674	$19,060,718
6	Surplus funds available for decommissioning for U1 in 2047 and Unit 2 in 2049.	$10,147,019	$9,730,584
7	ISFSI decommissioning cost study estimate (2022$)	$142,616	$142,616
8	Projected ISFSI decommissioning cost estimate (U1 – year 2047, U2 – year 2049)	$277,606	$292,799

*The NRC minimum amount is based on NUREG-1307, Rev. 19, for the burial factor, the Dec. 2022 BLS data for labor, and the Sept. 2022 BLS data for energy.