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Edwin I. Hatch Nuclear Plant Units 1 and 2
Vogtle Electric Generating Plant Units 1, 2, 3, and 4
2021 NRC Minimum Decommissioning Funding Requirement

Pursuant to 10 CFR 50.75 "Reporting and Recordkeeping for Decommissioning Planning", the U.S. Nuclear Regulatory Commission (NRC) requires nuclear power reactor licensees to adjust annually, in current year dollars, their estimate of the cost to decommission their plants. The annual updates are part of the process for providing reasonable assurance that adequate funds for decommissioning will be available when needed. The funding calculation is defined in NUREG-1307 and includes an adjustment factor that escalates Labor, Energy and Waste Burial costs to account for inflation and provide a current-year estimate.

To comply with this regulation, the 2021 NRC 10 CFR 50.75(c) minimum formula amount (MFA) for Hatch and Vogtle has been calculated in the attached report. Georgia Power's percentage share of the Hatch 2021 minimum funding requirement is \$330,900,000 per Unit, which represents a 4.4% increase from the 2020 calculation. The Vogtle 2021 minimum funding requirement is \$244,230,000 per Unit, which represents a 4.2% increase from the 2020 calculation. This increase was caused by inflation in labor and energy costs. A more detailed explanation of the calculations is attached, along with some relevant supplemental information.

Additional calculations are attached that provide the amount of trust funds projected to be accumulated at license termination and provide assurance that the fund will be sufficient to pay decommissioning costs.

If you have any questions or comments, please contact Ernest Bates at 205-276-6622.

Sincerely,

A handwritten signature in black ink, appearing to read "Ryan Joyce".

Ryan Joyce
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SNC Regulatory Affairs

Enclosure: 2021 NRC Minimum Decommissioning Funding Requirement

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**2021 NRC Minimum Decommissioning Funding Requirement
for the Edwin I. Hatch Nuclear Plant and the Vogtle Electric Generating Plant Units 1 and 2**

Purpose:

The purpose of this calculation is to determine the NRC minimum decommissioning funding requirement for Hatch and Vogtle 1-2 in accordance with the requirements of 10 CFR 50.75(c) to provide reasonable assurance that, at license termination, funding will be available to remove the facility safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use. The 10 CFR 50.75 (c) minimum formula amount (MFA) does not include the cost of removal and disposal of spent fuel or nonradioactive structures and materials beyond that necessary to terminate the license.

Additional calculations are attached that provide the amount of trust funds projected to be accumulated at license termination and provide assurance that the fund will be sufficient to pay decommissioning costs.

Summary of Results:

The total NRC MFA, in 2021 dollars, for each Unit at Hatch is \$660,383,026 or \$660,400,000 rounded up, and for each Unit at Vogtle is \$534,415,879, or \$534,420,000 rounded up. Georgia Power's 50.1% share for Hatch per Unit, rounded up in 2021 dollars, is \$330,900,000 which represents a 4.4% increase from the 2020 calculation. This increase was caused by inflation in labor costs and energy prices. Georgia Power's 45.7% share of the 2021 minimum funding requirement for Vogtle is \$244,230,000 per Unit, which represents a 4.2% increase from the 2020 calculation due to inflation in labor and energy prices. The calculations require the use of published cost escalation factors for labor, energy, and low-level radioactive waste (LLW) disposal from the U.S. Department of Labor, Bureau of Labor Statistics (BLS) employment cost index, BLS producer price indexes, and the NRC NUREG-1307 LLW burial waste index respectively.

Supplemental calculations demonstrate that the projected total for Georgia Power's funding share of the Hatch and Vogtle 1-2 would exceed the NRC MFA projections at license termination.

Methodology:

The methodology used to determine the NRC MFA is specified by 10 CFR 50.75(c)(1)(i). For BWRs, such as Hatch, with a rated thermal power (P) between 1200 MWt and 3400 MWt, the NRC MFA is expressed as:

$$\text{\$104} + 0.009 \text{ P (millions, January 1986 dollars)} \times \text{Adjustment Factor (to convert to current year)}$$

The Hatch Operating Licenses in paragraph 2.C(1) "Maximum Power Level" authorize a maximum rated thermal power (P) of 2,804 MWt. Therefore, the January 1986 NRC MFA is \$129,236,000.

[\$104,000,000 + (9000 * 2804) = \$129,236,000] The Hatch Unit 1 Operating License expires August 6, 2034. The Hatch Unit 2 Operating License expires June 13, 2038.

For PWRs, such as Vogtle, with a rated thermal power greater than or equal to 3400 MWt, the NRC MFA is expressed as:

\$105 (millions, January 1986 dollars) X Adjustment Factor (to convert to current year)

The Vogtle Operating Licenses for Unit 1 and Unit 2 in paragraph 2.C(1) "Maximum Power Level" authorize a maximum rated thermal power (P) of 3625.6 MWt. Therefore, the January 1986 NRC MFA is \$105,000,000. The Vogtle Unit 1 Operating License expires January 16, 2047. The Vogtle Unit 2 Operating License expires February 9, 2049.

The Vogtle Combined Licenses for Unit 3 and Unit 4 in paragraph 2.D(6) "Maximum Power Level" authorize a maximum rated thermal power (P) of 3400 MWt. Therefore, the January 1986 NRC MFA is \$105,000,000. The Vogtle Unit 3 and Unit 4 licenses will expire 40 years from the date that the NRC finds that the acceptance criteria in the combined license are met in accordance with 10 CFR 52.103(g). Because funding an NDT is tied to the 103(g) finding, projections for the NRC minimum and Vogtle 3-4 NDTs are not included herein.

10 CFR 50.75(c)(2) requires that the following adjustment factor be applied to the January 1986 MFA to reflect escalation of labor (L), energy (E), and low-level radioactive waste burial (B) as follows:

Adjustment Factor = (.65L + .13E + .22B) where,

"L" is the Labor Escalation Factor

- The Labor Factor is obtained by data provided by the BLS. Specifically, the index used is the total compensation for private industry workers in the South region.
- For Hatch and Vogtle, the ECI value for the 4th quarter 2021 is 145.6
- The BLS re-indexed the Employment Cost Index in 2005 to 100. As a result, the 2005 base index became 1.98.
- Therefore, the escalation factor for labor (L) is determined as follows: $(2005 \text{ Base Index} \times \text{ECI}_{(\text{current})})/100$, or $1.98 \times 145.6/100 = 2.883$.

"E" is the Energy Escalation Factor

- The cost escalation factor for energy (E) is a weighted average of industrial electric power (P) and fuels for transportation and heavy equipment operation (F). For BWRs, the energy factor is represented by the formula: $E = .54P + .46F$. For PWRs, the energy factor is represented by the formula: $E = .58P + .42F$.
- Energy cost escalation factors P and F are determined by Producer Price Indices (PPI), published by the U.S. Department of Labor – BLS.
- Specifically, P is obtained from the Industrial Electric Power Index (PPI Commodity Code 0543) and F is obtained from the Light Fuel Oils Index (PPI Commodity Code 0573). The index values from October 2021 were used in this calculation, which was the last actual (not projected) month of data for 2021 at the time of this report.

- The escalation factors for P and F for any given year are determined by dividing the respective index values from the last actual month of the previous year by the January 1986 index. For Hatch and Vogtle in 2021, the factors for P and F are:
 - $P = 255.3 \text{ (Oct 2021 value of code 0543)} \div 114.2 \text{ (January 1986 value of code 0543)} = 2.236$
 - $F = 349.6 \text{ (Oct 2021 value of code 0573)} \div 82.0 \text{ (January 1986 value of code 0573)} = 4.263$
- Therefore, the Energy Escalation Factor for Hatch is $E = .54(2.236) + .46(4.263) = 3.168$. And, the Energy Escalation Factor for Vogtle is $E = .58(2.236) + .42(4.263) = 3.087$.

"B" is the Waste Burial Escalation Factor

- The Waste Burial Factors, for BWRs and PWRs, is obtained from NRC NUREG-1307 Rev. 18, Report on Waste Burial Charges, Table 2-1.
- The factors used for Hatch and Vogtle are the value for low-level waste (LLW) generators located in states that are unaffiliated with a disposal facility. This B value represents a composite of the rates for two LLW disposal facilities located in Andrews, Texas and Clive, Utah.
- For BWRs (Hatch), the Table 2-1 value for B = 12.837. For PWRs (Vogtle), the Table 2-1 value for B = 12.793

MFA Calculation for Hatch

- The formula in 10 CFR 50.75(c) is $(\$104 + 0.0088P) \times (.65L + .13E + .22B)$
- Inputting the values above: $(\$104 + 0.009 (2804)) \times (.65(2.883) + .13(3.168) + .22(12.837))$
- For Hatch, therefore, a hand calculation of the minimum funding requirement is $\$129,236,000 * 5.1099 = \$660,383,036$.
- Rounding up to significant digits: \$660,400,000 per Unit or \$1,320,800,000 for the entire station.
- Rounding up GPC's share (50.1%) for Hatch is \$330,900,000 per Unit or \$661,800,000 total.

MFA Calculation for Vogtle

- The formula in 10 CFR 50.75(c) is $\$105M \times (.65L + .13E + .22B)$
- Inputting the values above: $\$105 \times (.65(2.883) + .13(3.087) + .22(12.793))$
- For Vogtle, therefore, a hand calculation of the minimum funding requirement is $\$105,000,000 * 5.0897 = \$534,418,500$.
- Rounding up: \$534,420,000 per Unit or \$1,068,840,000 for the entire plant.
- Rounding up GPC's share (45.7%) for Vogtle is \$244,230,000 per Unit or \$488,460,000 total.

Projected NRC MFA - Hatch

- An estimated NRC MFA at the end of the Hatch license can be projected using a simple calculation of Future Value of a Present Sum with the following assumptions:
 - Escalation Rate = 2.773% (composite average annual rate in the last (2021) site-specific decommissioning cost estimate for Hatch license termination costs.

- Number of Periods = 13 for Unit 1 and 17 for Unit 2 (years left until license termination)
- For Hatch Unit 1: Projected MFA in 2034 is \$942,400,000. (GPC's projected % is \$472,150,000.)
- For Hatch Unit 2: Projected MFA in 2038 is \$1,051,350,000. (GPC's projected % is \$526,800,000.)
- Total Plant Hatch Projected MFA is \$1,993,750,000. (GPC's projected % is \$998,900,000.)

Projected NRC MFA – Vogtle Units 1 and 2

- An estimated NRC MFA at the end of the Vogtle 1-2 license can be projected using a simple calculation of Future Value of a Present Sum with the following assumptions:
 - Escalation Rate = 2.700% (composite average annual rate in the last site-specific decommissioning cost estimate for Vogtle license termination costs.
 - Number of Periods = 26 for Unit 1 and 28 for Unit 2 (years left until license termination)
- For Vogtle Unit 1: Projected MFA in 2047 is \$1,068,360,000. GPC's projected % is \$488,250,000.
- For Vogtle Unit 2: Projected MFA in 2049 is \$1,126,822,000. GPC's projected % is \$514,960,000.
- Total Vogtle Projected MFA is \$2,195,182,000. GPC's projected % is \$1,003,200,000.

Georgia Power - Hatch Nuclear Decommissioning Trust (NDT) Funds Available and Projected

- The amount accumulated in the Georgia Power Hatch NDT as of 12/31/2021 is \$366,948,927 for Unit 1 and \$337,785,429 for Unit 2 for a total of \$704,734,356.
- The amount of trust funds projected to be accumulated at license termination assuming no annual contributions, 2.773% inflation (from the 2021 DCE) and 4.773% fund growth (2% real rate of return) is \$672,750,000 for Unit 1 (2034) (13 years) and \$746,250,000 for Unit 2 (2038) (17 years) for a total of \$1,419,000,000. (NRC regulations allow for a maximum 2% real rate of return for projected earnings, unless a rate-setting authority has specifically authorized a higher rate.) Using these assumptions, the projected total for Georgia Power's share of the Hatch station would exceed the NRC MFA projection by \$420,100,000. (\$1,419,000,000 - \$998,900,000).

Georgia Power - Vogtle Units 1 and 2 NDT Funds Available and Projected

- The amount accumulated in the Georgia Power Vogtle NDT as of 12/31/2021 is \$183,337,474 for Unit 1 and \$210,969,971 for Unit 2 for a total of \$394,307,445.
- The amount of trust funds projected to be accumulated at license termination assuming no annual contributions, 2.7% inflation and 4.7% fund growth (2% real rate of return) is \$605,153,000 for Unit 1 (2047) (26 years) and \$763,357,000 for Unit 2 (2049) (28 years) for a total of \$1,368,510,000. (NRC regulations allow for a maximum 2% real rate of return for projected earnings, unless a rate-setting authority has specifically authorized a higher rate.) Using these assumptions, the projected total for Georgia Power's share of the Vogtle station would exceed the NRC MFA projection by \$365,310,000. (\$1,368,510,000 - \$1,003,200,000).