

NRC Plant Decommissioning Funding Status Report- 2019

10 CFR 50.75(f)(1) requires each power reactor licensee to report to the NRC on a calendar year basis, beginning on March 31, 1999, and every 2 years thereafter, on the status of its decommissioning funding for each reactor or share of reactor it owns. Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri") hereby reports the decommissioning funding status for its Callaway Plant ("Callaway Energy Center").

The scope of the Ameren Missouri 2019 NRC Biennial Decommissioning Funding Status Report specifically pertains only to the decommissioning funding status of the Callaway Energy Center, or "plant." The decommissioning funding plan for the independent spent fuel storage installation (ISFSI) was submitted on August 6, 2018, via Ameren Missouri letter ULNRC-06447. Subsequent ISFSI decommissioning funding status reports will be submitted at intervals not to exceed three years, in accordance with the requirements of 10 CFR 72.30.

Ameren Missouri is required to file updates to decommissioning cost estimates and funding adequacy projections on a triennial basis with the Missouri Public Service Commission (MPSC) as discussed more fully in Section 2 below. The scope of these triennial filings includes both the plant and the ISFSI. Ameren Missouri obtains separate, updated site-specific decommissioning cost estimates and prepares separate, updated, funding adequacy analyses for the plant and for the ISFSI for the MPSC triennial filings. When making these filings, Ameren Missouri has requested that the MPSC address the plant and ISFSI separately in their orders issued pursuant to the filings. The decommissioning trust fund established by Ameren Missouri has separate, segregated sub-accounts for plant and ISFSI decommissioning funding.

The site-specific decommissioning study referenced in Ameren Missouri's 2019 NRC biennial decommissioning funding status report (as follows) is provided for information only. This site-specific study was part of the documentation presented to the MPSC in the Company's 2017 MPSC triennial update filing.

For this report, Ameren Missouri is using the NRC three-factor formula for determining decommissioning funding adequacy.

1. Amount of Decommissioning Funds Estimated to be Required Pursuant to 10CFR 50.75 (b) and (c)

For the purposes of this 2019 NRC biennial plant decommissioning funding status report, Ameren Missouri is using the "three-factor formula" specified in 10 CFR 50.75(b) and (c)¹ for determining decommissioning funding adequacy.

The minimum decommissioning cost estimate, pursuant to the 10 CFR 50.75(b) and (c) methodology, is \$516,964,000, in terms of December 2018 dollars.

The detailed calculations from which the above estimate is derived are contained in Enclosure 2.

Ameren Missouri also has site-specific decommissioning cost estimates for decommissioning of the Callaway Energy Center prepared by TLG Services, Inc. of Bridgewater, Connecticut. The specific studies are conducted to comply with Missouri Law:

4 CSR 240-3.185 Submission of Reports Pertaining to the Decommissioning of Electric Utility Plants

(3) On or before September 1, 1990 and every three (3) years after that, utilities with decommissioning trust funds shall perform and file with the commission cost studies detailing the utilities' latest cost estimates for decommissioning their nuclear generating unit(s) along with the funding levels necessary to defray these decommissioning costs. These studies shall be filed along with appropriate tariff(s) effectuating the change in rates necessary to accomplish the funding required. In addition, the commission, at any time for just cause, may require a utility to file an updated decommissioning cost study, funding requirement and associated tariff(s).

The current site-specific analysis approved by the MPSC was performed in August 2017. It calculated a decommissioning cost estimate of \$934,296,000 in terms of 2017 dollars.² Ameren Missouri considers this site-specific decommissioning cost estimate of \$934,296,000 as the estimate for which funding adequacy must be assured for MPSC funding adequacy purposes. Due to its site-specific nature, it is a more accurate estimate of projected decommissioning costs.

The site-specific estimate is considered more conservative as it includes non-radiological site restoration expenses and spent fuel management expenses, in addition to radiological license termination expenses. In the 2017 study, approximately 82.00% (\$766,145,000) of the \$934,296,000 site-specific cost estimate is associated with physical decontamination and dismantling of radioactive systems and structures such that the license can be terminated. Management and transfer of spent fuel accounts for 7.32% (\$68,391,000) of the site specific cost estimate. The remaining 10.68% (\$99,760,000) is for demolition of designated non-radioactive structures and limited site restoration.

These studies are considered snap shots of the decommissioning cost and are used to determine if any changes are required in the contributions to the decommissioning fund. Due to the complexity of the study the use of any cost escalation factors would introduce considerable uncertainty into the escalated cost. Since this study is conducted every three years, Ameren does not escalate the study cost estimates for the years between study periods.

An informational only copy of the 2017 Site-Specific Decommissioning Cost Analysis for the Callaway Energy Center is provided in Enclosure 3.

2. Amount of Decommissioning Funds Accumulated to the End of the Calendar Year Preceding the Date of this Report

The total amount accumulated in the decommissioning fund as of December 31, 2018 is \$629,988,615.48. This is an "after tax liquidation value" which reflects the final funds that would be received upon liquidation of the fund's assets and the payment of income taxes on realized capital gains. This is calculated as follows: ³

		Missouri Jurisdictional Subaccount	FERC Jurisdictional Subaccount	TOTAL Overall Fund
	Market Value:	\$ 665,598,529.10	\$ 17,197,392.15	\$ 682,795,921.25
Less:	Book Value:	405,096,966.06	13,662,426.31	418,759,392.37
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Equals:	Unrealized Gain:	\$ 260,501,563.04	\$ 3,534,965.84	\$ 264,036,528.88
	Income Tax on Unrealized Gain @ 20% Rate:	\$ 52,100,312.61	\$ 706,993.17	\$ 52,807,305.78
	After-Tax Liquidation Value:	\$ 613,498,216.49	\$ 16,490,398.98	\$ 629,988,615.48

Copies of the trustee's "Statement of Net Assets Available for Benefits" as of December 31, 2018 confirming the foregoing valuation amounts is provided in Enclosure 4.

This decommissioning fund balance indicated above is a total amount intended to cover the full green-fielding of the site. The funds in the trust fund are not segregated into sub-accounts for radiological decommissioning versus non-radiological decommissioning.

Based on the estimated plant decommissioning costs contained in the 2017 site specific decommissioning cost estimate, allocation percentages for License Termination, Spent Fuel Management and Site Restoration can be calculated. By applying these percentages to the after-tax liquidation value of the trust fund, the dollar amounts of the overall trust fund allocated for the decommissioning cost categories can be derived:

License Termination:	82.00%	of	\$ 629,988,615	=	\$ 516,590,664
Spent Fuel Management:	7.32%	of	\$ 629,988,615	=	\$ 46,115,167
Site Restoration:	10.68%	of	\$ 629,988,615	=	\$ 67,282,784

Missouri's definition of decommissioning encompasses both the radiological and non-radiological structures, systems and components of the plant, as stated in the following section from the Missouri Code of State Regulations:

4 CSR 240-20.070 Decommissioning Trust Funds

(1) As used in this rule, decommissioning means those activities undertaken in connection with a nuclear generating unit's retirement from service to ensure that the

final removal, disposal, entombment or other disposition of the unit and of any radioactive components and materials associated with the unit, are accomplished in compliance with all applicable laws, and to ensure that the final disposition does not pose any undue threat to the public health and safety. Decommissioning includes the removal and disposal of the structures, systems and components of a nuclear generating unit at the time of decommissioning.

Missouri law requires triennial updates of the decommissioning cost estimate and of funding adequacy. Missouri law also provides for the changing of rates charged to ratepayers to recover any changes in funding levels necessitated by the triennial update analyses. For these reasons, Ameren Missouri considers the amount in the fund to be fully adequate to cover radiological decommissioning with an excess that could be applied to non-radiological decommissioning. The triennial update process required by Missouri statutes is considered adequate to ensure that any funding shortfalls will be addressed and corrected in a timely manner. The applicable sections from the Missouri Code of State Regulations are as follows:

4 CSR 240-3.185 Submission of Reports Pertaining to the Decommissioning of Electric Utility Plants

(3) On or before September 1, 1990 and every three (3) years after that, utilities with decommissioning trust funds shall perform and file with the commission cost studies detailing the utilities' latest cost estimates for decommissioning their nuclear generating unit(s) along with the funding levels necessary to defray these decommissioning costs. These studies shall be filed along with appropriate tariff(s) effectuating the change in rates necessary to accomplish the funding required. In addition, the commission, at any time for just cause, may require a utility to file an updated decommissioning cost study, funding requirement and associated tariff(s).

4 CSR 240-20.070 Decommissioning Trust Funds

(7) Upon the filing of the appropriate tariff(s) as set in 4 CSR 240-3.180, the commission shall establish a schedule of proceedings which shall be limited in scope to the following issues:

- (A) The extent of any change in the level or annual accrual of funding necessary for the utility's decommissioning trust fund; and
- (B) The changes in rates which would reflect any change in the funding level or accrual rate.

In past triennial filings, the MPSC has accepted the site-specific decommissioning cost estimates and the funding adequacy analyses based on full green fielding of the site, as would be indicated under Missouri's legal definition of decommissioning. There is no basis for assuming any change in this practice in the future.

Consequently, it can be considered that the trust fund balance indicated is a total balance, not segregated on the basis of radiological versus non-radiological funding. As the Missouri

mechanism for assuring funding adequacy and for recovering decommissioning expenses from ratepayers includes the non-radiological decommissioning expenses as well as the radiological expenses, it is not necessary to segregate the decommissioning fund balances. Any shortfalls in funding for full green fielding are expected to be recovered from ratepayers as part of the triennial funding adequacy updating process.

3. Schedule of the Annual Amounts Remaining to be Collected:

As of December 31, 2018, the schedule of the annual decommissioning expense amounts remaining to be collected from ratepayers is \$6,323,396 per year for years 2019 through year 2043 and \$5,054,386 for year 2044.

As the operating license expires October 18, 2044 and decommissioning expense collections from ratepayers are assumed to cease upon the cessation of plant operations, 2044 is a "partial year" for collection and funding purposes, with the annual amount being pro-rated for three calendar quarters plus eighteen days:

$$(75\% \times \$6,323,396) + [(18/365) \times \$6,323,396] = \$5,054,386$$

The funding adequacy analysis performed by Ameren Missouri and approved by the MPSC is based on cash flows deposited into the decommissioning trust fund. Quarterly deposits into the fund are made on the 25th of the month following each quarter-end. Therefore, each year's cash contributions to the decommissioning fund will reflect the expense collected from ratepayers from Q4 of the preceding year plus that for Q1, Q2 and Q3 of the current year. For that reason, when looking at the funding adequacy analysis performed for the plant, the "Annual Cash Inflow from Contributions to Fund" value for the year 2044 will indicate \$6,635,235. That represents the \$1,580,849 expense collected from ratepayers for Q4 of 2043 plus the prorated \$5,054,386 for the January 1, 2044 through October 18, 2044, calculated above.

4. Actions by Regulatory Rate Setting Authorities, Assumptions Used Regarding Rates of Escalation in Decommissioning Costs, Rates of Earnings on Decommissioning Funds, and Rates of Other Factors Used in Funding Projections:

In accordance with the previously cited 4 CSR 240-3.185 requirement, Ameren Missouri was required to file its latest updated decommissioning cost estimate and funding adequacy analysis with the MPSC by September 1, 2017.

On September 1, 2017, Ameren Missouri filed its "Application for Acceptance of Decommissioning Cost Estimates for Callaway Energy Center, Including Independent Spent Fuel Storage Installation, and Approval of Funding Level for Nuclear Decommissioning Trust Fund" (File No. EO-2018-0051). A copy of the application is provided in Enclosure 5. Attachment 3 to this application contained the August, 2017 decommissioning cost estimate for the Callaway Energy Center.⁴ Attachment 4 to the application contained Ameren Missouri's analysis of the required funding level for the decommissioning trust fund,

including all of the financial and economic assumptions on which the funding analysis was based. A copy of the relevant pages of Attachment 4 to the application is provided in Enclosure 6.⁵

On January 4, 2018, Ameren Missouri and the MPSC Staff entered into a "Non-Unanimous Stipulation and Agreement" that received Ameren Missouri's application and funding level analyses into evidence and requested the MPSC to approve the funding level requested by Ameren Missouri in the application, as well as the real rate of return and other financial and economic assumptions used in the funding level analysis. A copy of the "Non-Unanimous Stipulation and Agreement" is provided in Enclosure 7.

On January 23, 2018, the MPSC issued an "Order Approving Stipulation and Agreement" (effective February 22, 2018) that approved the foregoing "Non-Unanimous Stipulation and Agreement" as well as continuing the contribution to the decommissioning trust fund at the current level of \$6,758,605 annually (with \$6,323,396 allocated to Plant decommissioning and \$435,209 allocated to ISFSI decommissioning) and affirming that Missouri is 100% responsible for the decommissioning liability. The MPSC Order also approved the rates of return and other financial and economic assumptions described in the "Non-Unanimous Stipulation and Agreement" and used in the funding level analysis.

In the Order, the MPSC approved the following actuarial assumptions used by Ameren Missouri in its decommissioning funding adequacy analysis filed with the application and referenced in the "Non-Unanimous Stipulation and Agreement":

- The Missouri jurisdictional allocator is 100%.
- The federal income tax rate is 20%.
- The state income tax rate is 0%.
- The composite federal & state income tax rate is 20%.
- An asset allocation of 65% equities and 35% bonds is assumed to exist through 2043, at which time all equity investments will be divested.
- Investment management and trust fees are estimated at 15 basis points annually.
- An inflation rate of 2.200% is assumed for general ("CPI") inflation.
- The pre-tax & expense nominal return on bonds is assumed to be 3.900%.
- The pre-tax & expense real return on bonds is assumed to be 1.700%.
- The pre-tax & expense nominal return on equities is assumed to be 8.600%.
- The pre-tax & expense real return on equities is assumed to be 6.400%.
- The pre-tax & expense nominal weighted-average return is assumed to be 6.955% through the 2043 date of divestiture of equity investments.
- The pre-tax & expense real weighted-average return is assumed to be 4.755% through the 2043 date of divestiture of equity investments.
- The pre-tax & expense real weighted-average return is assumed to be 1.700% following the 2043 date of divestiture of equity investments.

Based on the foregoing assumptions, the anticipated annual decommissioning contributions would be adequate up to an annual decommissioning inflation rate of 4.0519%. The

annualized rate of earning on decommissioning fund return (pre-tax and fee) required at the above level of inflation is 6.511%.

A copy of the MPSC "Order Approving Stipulation and Agreement" is provided in Enclosure 8.

As of the March 22, 2019 date of this report, the MPSC Order in this Case EO-2018-0051 continues to be the effective ruling establishing state regulatory authority approved return and funding assumptions.

5. **Any Contracts Upon Which the Licensee is Relying on Pursuant to 10 CFR 50.75(E)(L)(V):**

None

6. **Any Modifications Occurring to a Licensee's Current Method of Providing Financial Assurance Since the Last Submitted Report:**

None.

The Company has used the "External Sinking Fund" method since 1985.

7. **Any Material Changes to Trust Agreements:**

There have been no material changes to the qualified trust agreement since the last report.

The non-qualified trust that was required by Illinois has been eliminated, as Ameren Missouri no longer has customers in Illinois. This non-qualified trust was never funded.⁶

8. **References**

1. ULNRC-06201, "Status of Decommissioning Funding," dated March 30, 2015
2. ULNRC-06349, "Status of Decommissioning Funding," dated March 30, 2017

¹The NRC formulas in section 10 CFR 50.75(c) include only those decommissioning costs incurred by licensees to remove a facility or site safely from service and reduce residual radioactivity to levels that permit: (1) release of the property for unrestricted use and termination of the license; or (2) release of the property under restricted conditions and termination of the license. The cost of dismantling or demolishing non-radiological systems and structures and the costs of managing and storing spent fuel on site until transfer to DOE are not included in the 10 CFR 50.75(c) cost formulas.

² This estimate is applicable to the 60-year operating life, DECON decommissioning alternative scenario with low-level radioactive waste processing, and is presented in Appendix C of the August, 2017 site specific decommissioning cost estimate. This is the option Ameren Missouri intends to utilize for plant decommissioning. (Note: The cost estimates shown in Appendix C are consolidated totals for the plant and for the ISFSI. The table on page *xix of xx* of the "Executive Summary" and Tables 3.1, 3.1a, 3.1b and 3.1c in the "Cost Estimate" section of the report show the breakdown of the plant versus ISFSI costs.)

³ The valuations of the Missouri and FERC jurisdictional subaccounts are utilized in this report to calculate the total valuation of the plant decommissioning fund as the trust statements produced by the trustee do not include a consolidated report that does not include the ISFSI decommissioning subaccounts. Consequently, to provide supporting documentation, it was necessary to provide the trust statements for the two component plant decommissioning funds: the Missouri and FERC subaccounts and sum their valuations.

⁴ The August 2017 site specific decommissioning cost estimate (Attachment 3 to the "Application for Acceptance of Decommissioning Cost Estimates for Callaway Energy Center, Including Independent Spent Fuel Storage Installation, and Approval of Funding Level for Nuclear Decommissioning Trust Fund") is provided in Enclosure 3 to this report.

⁵ Enclosure 6 only includes the pages of the funding adequacy model applicable to the plant decommissioning. The portions of the model applicable to the ISFSI were not included.

⁶ On February 10, 2005, the MPSC approved Ameren Missouri's proposed transfer of its Illinois electric and gas properties to an Illinois affiliate, Ameren Illinois. The closing date for the property transfer was May 2, 2005. In accordance with the MPSC Order, the tax-qualified decommissioning trust's Illinois jurisdictional sub-account was eliminated following the closing. Ninety-eight percent of the assets in the existing Illinois subaccount as of the closing date were reallocated to the Missouri sub-account and the remaining two percent were reallocated to the Wholesale sub-account. As a result of the transfer, Ameren Missouri no longer has any Illinois ratepayers and will no longer collect decommissioning contributions in Illinois for its Callaway Plant, which is located in Missouri. The decommissioning liability previously borne by the Illinois ratepayers was transferred to Ameren Missouri and Wholesale customers. Decommissioning expenses collected from Missouri jurisdictional ratepayers was increased by \$272,194 annually in accordance with the MPSC Order to account for the increased decommissioning liability borne by the Missouri ratepayers following the property transfer.