Memorandum from the Office of the Inspector General

December 18, 2024

Roger T. Waldrep

REQUEST FOR FINAL ACTION – AUDIT 2024-17481 – SOLAR PANELS PURCHASED FOR LAWRENCE COUNTY SOLAR PROJECT

Attached is the subject final report for your review and final action. Your written comments, which addressed your management decision and actions planned or taken, have been included in the report. Please notify us when final action is complete. In accordance with the Inspector General Act of 1978, as amended, the Office of the Inspector General is required to report to Congress semiannually regarding audits that remain unresolved after 6 months from the date of report issuance.

If you have any questions or wish to discuss our findings, please contact Ala H. McAfee, Senior Auditor, at (423) 785-4833 or Rick C. Underwood, Director, Financial and Operational Audits, at (423) 785-4824. We appreciate the courtesy and cooperation received from your staff during the audit.

David P. Wheeler

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)

AHM:KDS
Attachment
cc (Attachment):
TVA Board of Directors
Janda E. Brown
Buddy Eller
David B. Fountain
Tracy E. Hightower
Jeffrey J. Lyash
Jill M. Matthews
Ben R. Wagner
Robert Bryan Williams
OIG File No. 2024-17481

Office of the Inspector General

Audit Report

To the Vice President,
Major Projects

SOLAR PANELS PURCHASED FOR LAWRENCE COUNTY SOLAR PROJECT

<u>Audit Team</u>
Ala H. McAfee
Maria V. Edwards

Audit 2024-17481
December 18, 2024

ABBREVIATIONS

CC&I	Corporate Credit and Insurance
EPMO	Enterprise Project Management Office
IRA	Inflation Reduction Act
IRP	Integrated Resource Plan
ITC	Investment Tax Credit
LCS	Lawrence County Solar
MW	Megawatt
PAB	Project Approval Board
PPA	Power Purchase Agreement
PRB	Project Review Board
R3	Risk and Readiness Review
SPP	Standard Programs and Processes
TVA	Tennessee Valley Authority
TVA Board	TVA Board of Directors
U.S.	United States

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APPENDICES

Audit 2024-17481 – Solar Panels Purchased for Lawrence County Solar Project

EXECUTIVE SUMMARY

Why the OIG Did This Audit

In June 2019, the Tennessee Valley Authority (TVA) completed an Integrated Resource Plan (IRP) to determine how TVA will meet the demand for electricity in its service territory over the next 20 years, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts. The 2019 IRP recommended the expansion of solar generating capacity by up to 14,000 megawatts (MW) by 2038. According to TVA's fiscal year 2020 Sustainability Report, TVA set a sustainability aspiration to achieve 10,000 MW of solar generation by 2035.

To help achieve this goal, in 2021 TVA purchased 3,000 acres to construct the first large TVA-developed solar facility in Lawrence County, Alabama. Approximately 1,500 acres were planned for development to construct an estimated 200 MW solar facility for solar generation that would become the site of the Lawrence County Solar (LCS) project. TVA purchased 139,750 solar panels, totaling $30 million, in December 2019 for installation at the LCS project. TVA began receiving these solar panels in late January 2020 and received the final shipment on March 30, 2020. The project was originally estimated to be in service by December 2023. Due to delays in the LCS project, the solar panels purchased in 2019 were transferred to another TVA project. TVA subsequently purchased an additional 581,250 solar panels for $92.7 million in May 2023[i] for installation at the LCS project.

TVA's Standard Programs and Processes 34.000, *Project Management*, states risk assessments should be performed as early as possible in a project to identify critical technical, performance, schedule, and cost risks. Due to the length of time the solar panels purchased in 2019 for the LCS project have been in inventory, we performed an audit of TVA's assessment of risks associated with solar panel purchases for the LCS project. Our audit objective was to determine if TVA assessed risks in accordance with applicable policies and procedures prior to the purchase of solar panels for the LCS project. Our audit scope included the solar panels purchased in calendar years 2019 and 2023.

What the OIG Found

We determined TVA (1) did not perform a risk assessment prior to purchasing solar panels in 2019 and (2) only performed a partial risk

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[i] According to the contract with the supplier, these panels are scheduled to be delivered to TVA between May 4, 2026, and September 11, 2026.

assessment prior to the purchase of the 2023 solar panels. Additionally, the solar panels purchased in 2023 were procured after the project had been placed on hold by TVA.

What the OIG Recommends

We made three recommendations to the Vice President, Major Projects, to strengthen internal controls and develop guidance to ensure assessment of risk occurs prior to purchasing long-lead procurements such as solar panels.

TVA Management Comments

In response to our draft report, TVA management agreed with our recommendations and provided actions they plan to take to address each recommendation. See Appendix C for TVA management's complete response.

Auditor's Response

We agree with TVA management's planned actions.

BACKGROUND

In June 2019, the Tennessee Valley Authority (TVA) completed an Integrated Resource Plan (IRP) to determine how TVA will meet the demand for electricity in its service territory over the next 20 years, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts. The 2019 IRP recommended the expansion of solar generating capacity by up to 14,000 megawatts (MW) by 2038. In its fiscal year 2020 Sustainability Report, TVA set a goal to achieve 10,000 MW of solar generation by 2035. According to multiple TVA presentations, TVA's 10,000 MW goal would require 100,000 acres or 156.25 square miles of solar farms.

To help fulfill its renewable energy goals, TVA planned to construct a 200 MW solar facility in Lawrence County, Alabama.[1] The Lawrence County Solar (LCS) project originally had a budget of $317 million and was estimated to be in service by December 2023. On December 31, 2019, TVA entered into a $30 million contract with a supplier to purchase 139,750 solar panels which would provide 56.6 MW of the planned 200 MW LCS facility. As discussed below, TVA entered into the contract on December 31, 2019, to eventually be able to receive an Investment Tax Credit (ITC) for investing in solar projects.

Investment Tax Credit

According to LCS project documentation and discussions with TVA personnel, TVA purchased the solar panels in 2019 to "safe harbor" an estimated $600 million of eligible project costs in one or more TVA solar projects to receive an ITC. According to the Department of Energy, "The ITC is a tax credit that reduces the federal income tax liability for a percentage of the cost of a solar system that is installed during the tax year." According to LCS project documentation, TVA had to (1) enter into a contract to purchase solar panels on or before December 31, 2019, and (2) have the solar facility in operation by December 2023 to be eligible for the ITC.

According to an economic analysis[2] performed by TVA's Portfolio Analytics, the LCS project was originally planned to be constructed by TVA then temporarily sold to investors, with power purchased by TVA under a power purchase agreement (PPA).[3] The PPA would contain provisions for TVA to repurchase the facility at PPA-end or as negotiated, whereafter TVA would own and operate the solar facility.

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[1] In October 2019, TVA obtained an option to purchase 3,000 acres in Lawrence County for the planned solar facility. TVA subsequently purchased the 3,000 acres for $22.4 million on September 15, 2021. TVA planned to use 1,500 acres for the solar facility. According to TVA LCS project documentation, the remaining 1,500 acres were not suitable for development due to environmental/cultural restrictions.

[2] According to TVA-SPP-13.950, *Economic Analysis*, the economic analysis provides guidance on analyzing the benefits, costs, and economic impacts of the project under consideration.

[3] Since TVA is not subject to federal income taxes, the use of a PPA was required to realize the benefits of the ITC.

Due to delays with obtaining the remainder of the solar panels needed to complete the LCS project, the solar panels purchased in 2019[4] were administratively transferred to another TVA project, Project Phoenix[5] in April 2023. Approximately 133,000 of the solar panels are currently in storage awaiting installation at Project Phoenix with approximately 7,000 panels being used for visual demonstration purposes at the project site.

Inflation Reduction Act of 2022

The passage of the Inflation Reduction Act of 2022 (IRA) on August 16, 2022, extended the ITC through 2033 and created several additional tax credits related to renewable energy creation, including a domestic content bonus.[6] The IRA identified TVA as a tax-exempt entity allowed to receive tax credits as "direct pay." This means TVA could receive a payment from the United States (U.S.) Treasury in lieu of claiming a tax credit without entering into a PPA as would have been necessary under the rules of the ITC. In February 2023, TVA requested proposals for U.S. manufactured solar panels for the LCS project in accordance with the domestic content requirements specified in the IRA to be eligible for a direct payment. In May 2023, TVA entered into a contract for 581,250 domestically manufactured solar panels for $92.7 million that included an $18.5 million nonrefundable down payment. The solar panels are scheduled to be delivered to TVA between May 4, 2026, and September 11, 2026.

On August 9, 2024, TVA announced a request for proposal from qualified solar energy providers to design, engineer, build, operate, and maintain a photovoltaic power generation facility within the LCS site. The selected third party will construct, operate, and maintain the site and fulfill the obligations of a PPA with TVA. As a result of this decision, TVA may not be eligible to receive IRA direct payments.

TVA Risk Management Policies and Procedures

TVA's Standard Programs and Processes 34.000, *Project Management*, provides a standardized framework for projects with an estimate of greater than or equal to $250,000 and serves as a basis for TVA's risk management processes. The SPP defines risk management as, "The handling of risks through specific methods and techniques. Risk assessments should be performed as early as possible in the project and should identify critical technical, performance, schedule, and cost risks. Once risks are identified, sound risk mitigation strategies and actions should be developed and documented."

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4 TVA began receiving these solar panels in late January of 2020 and received the final shipment on March 30, 2020.

5 Project Phoenix is a TVA pilot solar project that is intended to leverage the closed coal combustion residual units at Shawnee Fossil plant for solar generation. The project is estimated to be in service by June 2028.

6 A project is potentially eligible for a domestic content bonus credit if the domestic content requirement is met. A project would meet the domestic content requirement if all steel or iron were produced in the U.S. and a required percentage of the total costs of manufactured products were mined, produced, or manufactured domestically.

According to TVA-SPP-34.000, the TVA Project Approval Board (PAB) provides project approvals at each phase gate.[7] Subsequent to each PAB approval, project funding authorizations shall follow the requirements outlined in the Funding Authorization Matrix located in TVA's *Portfolio Management Guide* (see Appendix B). According to the Funding Authorization Matrix, project funding requests equal to or greater than $10 million require additional approval by the TVA Project Review Board (PRB).

According to TVA's policies and procedures, the following risk management processes are required to be developed for all projects greater than or equal to $10 million and completed prior to receiving Phase Two and Phase Three funding approvals:

- Risk Register – According to TVA-SPP-34.000 and other TVA guidance, a project risk register is created for risk identification, assessment, and mitigation. The project manager will create an initial risk register and incorporate risks from previous similar type projects and project manager knowledge. The risk register lists multiple risk types that can include risk descriptions related to long-lead material, legislation/political external risk, public opposition, etc. The project manager and Joint Project Team[8] will conduct a team risk meeting and generate a comprehensive list of project risks with specific risk descriptions and potential cost and schedule impacts to the project.
- Monte Carlo Simulation – TVA-SPP-34.000 states a Monte Carlo simulation is required to be completed based on the risk register to aid in determining a project's schedule and cost contingency. The Monte Carlo analysis is meant to provide a quantitative assessment of the project risks to determine project contingency and weigh the cost of managing risks.
- Risk and Readiness Review (R3) – TVA-SPP-34.001, *Project Management Governance, Oversight, Execution and Support*, applies to all TVA projects within the scope of TVA-SPP-34.000 and describes relevant governance, oversight, execution, and support activities. An R3 is a type of 'stage-gate' independent review process that provides executive leadership and business unit management with an overall assessment of project quality, risk, and readiness. The documentation reviewed during the R3 process includes the risk register and Monte Carlo analysis to verify the project manager's process for identifying, assessing, managing, and monitoring risks. The results of the R3 are meant to indicate the readiness of the project to progress to Phase Two

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7 TVA projects are typically approved at three phase gates, with the most common phase progression being the following: Phase One – Project Plan, Phase Two – Project Design, and Phase Three – Project Implementation. The SPP states Partial Phase Two funding approval may be requested to procure long-lead material. Additionally, the SPP defines long-lead material as equipment or materials whose procurement lead time requires commitment of funds prior to phase three to support scheduled installation dates or avoid negative impacts to the project schedule.

8 TVA-SPP-34.000 defines Joint Project Team as those leading and providing services to the project. They maintain an appropriate level of specific knowledge and expertise to plan, design, permit, construct/implement, and close out the project. They support the project manager by providing definitive scope, cost, schedule, risk, and other appropriate information through the project's lifecycle.

and Phase Three.[9] According to the SPP, the R3 should be completed one month prior to requesting phase gate approval from the PAB.

TVA-SPP-13.038, *TVA Corporate Credit Policy*, assigns counterparty credit management to TVA's Corporate Credit and Insurance (CC&I) group, including oversight of credit-related activities across TVA's business units. According to the SPP, CC&I performs a credit analysis for the identification and assessment of the creditworthiness of its counterparties. If CC&I identifies counterparty risk, they seek to mitigate such credit exposures through contractual terms, and, when appropriate, obtain some form of performance assurance.

We performed an audit of TVA's assessment of risks associated with solar panel purchases for the LCS project due to the length of time the solar panels purchased in 2019 have been in TVA's inventory.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our audit objective was to determine if TVA assessed risks in accordance with applicable policies and procedures prior to the purchase of solar panels for the LCS project. Our audit scope included (1) solar panels purchased in December 2019 totaling $30 million and (2) solar panels purchased in May 2023 totaling $92.7 million. A complete discussion of our audit objective, scope, and methodology is included in Appendix A.

FINDINGS

We determined (1) TVA did not perform a risk assessment prior to purchasing solar panels in 2019 and (2) the 2023 solar panel purchase was not assessed for risk in accordance with TVA policies and procedures. Additionally, the solar panels purchased in 2023 were procured after the project had been placed on hold by TVA.

RISK ASSESSMENT WAS NOT PERFORMED PRIOR TO PURCHASE OF SOLAR PANELS IN 2019

Risks relating to the supplier's creditworthiness were assessed during the contract approval process in accordance with TVA-SPP-13.038, *TVA Corporate Credit Policy*. However, we found no documented evidence that a risk assessment for the LCS project was performed prior to TVA's purchase of solar panels in 2019 in accordance with TVA-SPP-34.000, *Project Management*. Specifically, we determined TVA did not assess risks or develop and document mitigation strategies associated with the ITC and technological improvements.

9 An R3 delay request may be approved by the Enterprise Project Management Office for projects greater than or equal to $10 million.

Risks Associated with Applying Investment Tax Credit

According to project documentation and discussions with TVA personnel, TVA purchased solar panels in 2019 for the sole purpose of securing the ITC that would be applied to a TVA solar project. According to our review of LCS project documentation, TVA planned to take delivery of the solar panels before April 2020 and have the LCS project in service by December 2023 to be eligible to receive the ITC. However, there was no formal documentation of risks specific to TVA's ability to receive the ITC that should have been considered in a risk assessment, including the risk of (1) not having the LCS project in service by the end of calendar year 2023 as required to receive the ITC and (2) legislative changes that could affect the application of the ITC to the LCS project.

With the passing of the IRA in August 2022, the required in-service date for TVA to receive the full ITC was extended from the end of 2023 to the end of 2033. However, the solar panels purchased in 2019 do not meet the IRA's domestic content requirement, so TVA is not eligible to receive the maximum domestic content bonus.

According to TVA personnel and review of LCS project documentation, TVA has hired multiple consultants to assist in understanding the IRA and ITC requirements across all TVA projects. Additionally, according to Generation Projects and Fleet Services personnel, since the solar panels purchased in 2019 were transferred to Project Phoenix, the project needs to continue to receive project funding approvals from the PAB and PRB to ensure the project meets the Internal Revenue Service's requirement for continuous effort to advance towards completion of the solar facility to receive the ITC.

To date, TVA has not received any payments under the ITC for the solar panels purchased in 2019. In addition to the $30 million cost of the solar panels, as of June 30, 2024, TVA had paid another $1.1 million for the delivery, handling, and storage of the solar panels purchased in 2019.

Risks Associated with Technological Improvements

TVA did not consider the risk that technological improvements could reduce the value of procuring solar panels prior to the initiation of the LCS project. The solar panels purchased in 2019 cost 60 percent more per watt than the solar panels purchased in 2023 for the LCS Project three and a half years later, as shown in Table 1 below.

Solar Panels Purchased for LCS Project					
Solar Panel Purchase Year	Panel Quantity	Watts per panel	Total Watts*	Contract Amount	Cost per Watt**
2019	139,750	405	56,598,750	$29,997,338	$0.530
2023	581,250	480	279,000,000	$92,711,700	$0.332

* The same wattages of solar panels purchased in 2023 versus solar panels purchased in 2019 would have cost $11.3 million less (56,598,750 watts x 20 cents).

** The solar panels purchased in 2019 cost 20 cents more per watt (60 percent) than the solar panels purchased in 2023.

Table 1

In a previous OIG Audit 2017-15471, *Wind Power Contracts*, we recommended TVA (1) take a measured approach to large projects or significant programs in areas TVA does not have familiarity or that are new to TVA and (2) consider entering smaller contracts to gain a better understanding of the industry and market.

If TVA's solar strategy changes significantly, TVA runs the risk of wasted funds due to technological advancements and financial risks that could have been better spent on other projects. Additionally, public opposition to large scale solar farms makes it even more important to ensure TVA purchases the most efficient panels possible to ensure the best use of the land.

SOLAR PANELS PURCHASED IN 2023 WERE NOT ASSESSED FOR RISK IN ACCORDANCE WITH TVA POLICIES AND PROCEDURES

The contract to purchase the solar panels in 2023 for a total of $92.7 million, which included an $18.5 million non-refundable down payment, was approved by TVA's Chief Executive Officer on May 11, 2023. In accordance with TVA-SPP-13.038, *TVA Corporate Credit Policy,* risks relating to the supplier's creditworthiness were assessed through TVA's Corporate Credit department during the contract approval process. Due to the financial condition of the counterparty and the presence of an advance payment, the credit memorandum prepared by CC&I required performance assurance that resulted in the solar panel supplier providing a surety bond to TVA for $18.5 million. However, other risk assessment procedures required by TVA-SPP-34.000, *Project Management,* were not performed in accordance with the SPP. Specifically, the project's risk register was not effectively managed and monitored and an updated R3 was not completed within one month of PAB review.

Risks Not Effectively Managed and Monitored
TVA-SPP-34.000 requires the risk register to be reviewed periodically and updated as part of the preparation for a new phase or funding approval. The necessary actions that should take place during the review include adding new risks and reassessing the probability of occurrence, cost impacts, and schedule impacts for each risk. The risk register for the LCS project was dated November 19, 2021, and analyzed risks such as delays receiving solar panels due to global supply chain challenges and the overall quality of the solar panels received. However, the risk register was never reviewed and updated throughout the project to (1) reassess risks as they were occurring or (2) analyze additional risks the LCS project was facing with procurement of solar panels needed for the project.

Additionally, based on our review of the Monte Carlo analysis and discussions with TVA Project Control personnel, we determined project risks may not have been properly rated (i.e., low, moderate, or high) due to data entry errors. As stated in TVA's Risk Management Process Guide, proper monitoring and rating of risks ensures that desired project outcomes are more likely to be achieved at the lowest impact to cost, schedule, and with the lowest capital requirements.

TVA-SPP-34.000 was updated in October 2023 with the requirement that project managers use the Project Risk and Contingency Tool developed by TVA to replace current risk registers. According to TVA documentation, the tool improves risk register data quality and contingency accuracy as well as improves risk monitoring and control processes.

Risk and Readiness Review Not Updated with Emerging Risks Prior to Project Approval Board Review

We reviewed the R3 performed for the LCS project and noted the R3 was completed in December 2021 and presented seven months later in July 2022 for Phase Two funding review and approval from the PAB. However, TVA-SPP-34.001, *Project Management Governance, Oversight, Execution, and Support*, requires an R3 to be completed within one month of requesting Phase Two and Phase Three approval from the PAB. Additionally, we determined several emerging risks were not included in the R3 prior to its presentation to the PAB for review.

The Phase Two funding request included entering a contract with an engineering procurement and construction contractor who would procure the additional solar panels needed for the LCS Project and construct the solar facility. The results of the R3 completed in December 2021 showed the project was low risk and recommended the project receive Phase Two approval. By July 2022 when the LCS project went for Phase Two approval to the PAB, other risks were emerging related to (1) increased solar panel costs, (2) supply chain issues with obtaining domestically made solar panels, and (3) increased contractor costs that impacted the overall total project cost. For example, the cost of solar panels TVA planned to procure through the contractor had risen over 163 percent from the budgeted amount for the solar panels provided in the documentation submitted for the R3.

Ensuring emerging risks are included in the R3 prior to requesting funding approval from the PAB should allow for more accurate decision making relative to project approvals.

SOLAR PANELS PROCURED WHILE PROJECT WAS ON HOLD

On July 14, 2022, the PAB approved the project for the Phase Two funding request described above, but the project was put on hold on July 22, 2022, to use the funds for other capital needs at TVA. In a March 2023 LCS project update presentation created by members of the Joint Project Team and Portfolio Analytics personnel, the presentation noted the LCS project had high capital burdens due to total project costs increasing to $471 million and the IRA credits not being received until after project completion.

Although full Phase Two funding was never obtained from the PRB, the LCS project moved forward with the procurement of solar panels in May 2023 with preapproved funding to cover the $18.5 million down payment required for the solar panels. The PAB and PRB were not presented with an updated estimate of total project costs that included the full contract amount for the solar panels purchased in 2023. In order for the PAB and PRB to act in TVA's best interest when reviewing projects and approving project funding, it is important they are provided with updated total project costs.

TVA-SPP-34.000 was updated effective May 1, 2024. Although the update falls outside the scope of this audit, it provides guidance on and oversight to the authorization of spend. The updated SPP states, "When procurement circumstances require projects to make pre-payments to reserve a spot in line, a partial or full phase one approval with a conceptual estimate for the total project cost shall be submitted prior to entering any contractual agreement with a vendor."

RECOMMENDATIONS

We recommend the Vice President, Major Projects:

1. Develop procedures to ensure an assessment of risk is completed and PAB and/or PRB approval is obtained prior to purchasing or providing pre-payments for long-lead procurements.

   TVA Management's Comments – In response to our draft report, TVA management agreed with our recommendation and stated they have made a commitment to retrain on the SPP 34 series. See Appendix C for TVA management's complete response.

   Auditor's Response – We agree with TVA management's planned actions.

2. Verify emerging risks are included in the Project Risk and Contingency Tool prior to requesting any additional project funding approvals from the PAB and/or PRB.

   TVA Management's Comments – In response to our draft report, TVA management agreed with our recommendation and stated they will report to the Enterprise Project Management Office (EPMO) when new risks are learned after an R3 has been completed. See Appendix C for TVA management's complete response.

   Auditor's Response – We agree with TVA management's planned actions.

3. Develop procedures to ensure that emerging risks are included in the R3 prior to the presentation to the PAB and PRB.

   TVA Management's Comments – In response to our draft report, TVA management agreed with our recommendation and stated they will report to the EPMO when new risks are learned after an R3 has been completed.[10] We contacted TVA management for clarification on TVA's planned action. According to TVA management, a procedure for emerging risks is covered under SPP-34.000 as well as the EPMO-developed Risk Management Process Guide but noted TVA management recognizes the validity of the finding. As such, they are committing to specifically coordinate with EPMO and document through the Project Risk and Contingency Tool when risks are identified following an R3 but prior to PAB and PRB.

   See Appendix C for TVA management's complete response.

   Auditor's Response – We agree with TVA management's planned actions.

[10] In their response to the draft report, TVA management also stated the "Hold" indicated in the finding "Solar Panels Procured While Project Was On Hold" was a self-imposed delay on project execution, and that funding approval for long-lead procurements had been obtained through PAB/PRB, and TVA Board approval for solar panel procurements had been granted.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our audit objective was to determine if the Tennessee Valley Authority (TVA) assessed risks in accordance with applicable policies and procedures prior to the purchase of solar panels for the Lawrence County Solar (LCS) project. Our audit scope included (1) $30 million of solar panels purchased in December 2019 and (2) $92.7 million of solar panels purchased in May 2023. To achieve our audit objective, we:

- Reviewed TVA Standard Programs and Processes (SPP) to identify key requirements applicable to project risk assessments:
  - TVA-SPP-34.000, *Project Management*[1]
  - TVA-SPP-13.950, *Economic Analysis*
  - TVA-SPP-13.038, *TVA Corporate Credit Policy*
  - TVA-SPP-34.001, *Project Management Governance, Oversight, Execution and Support*
  - TVA-SPP-04.000, *Management of the TVA Supply Chain Process*
  - Transmission Operations and Power Supply, Power Operations SPP-29.704, *Power Acquisition*
- Reviewed TVA guidance to identify risk assessment procedures and processes, including:
  - Portfolio Management Guide
  - Risk and Readiness Review Guide
  - Risk Management Guidance
  - Lessons Learned Guide
  - Risk Management Process Guide
  - Project Complexity Guide
- Reviewed TVA presentations, including briefings, project meeting minutes and decisions, Project Approval Board (PAB) and Project Review Board (PRB) agendas.
- Reviewed documentation for the LCS project, including economic analyses, risk registers, Monte Carlo analyses, Project Management Plan, Procurement Management Plan, project complexity reports, the Risk and Readiness Review report and follow-up actions, lessons learned, and project budget/forecast information.
- Reviewed tax guidance for the Investment Tax Credit and Inflation Reduction Act obtained from TVA's SharePoint and internet searches, including Internal Revenue Service guidance.

[1] We reviewed TVA-SPP-34.000, Revision 6 and 7, effective October 1, 2017, and November 5, 2020, respectively, that were effective during the time period when the solar panels were purchased.

- Reviewed TVA contracts, purchase orders, request for proposals, invoices, and recommendation for award for the LCS project.
- Reviewed contract approval memos and credit memorandums for the 2019 and 2023 solar panel purchases.
- Reviewed surety bond issued based on the credit memorandum for the 2023 solar panel purchase.
- Reviewed TVA Board minutes, resolutions, and approvals relating the LCS project.
- Reviewed 2019 Integrated Resource Plan and Fiscal Year 2020 Sustainability Report.
- Obtained an understanding of internal controls associated with TVA's assessment of risks for projects. We considered the following three internal controls to be significant to our audit objective: (1) Risk Register and Monte Carlo analysis, (2) Risk and Readiness Review, and (3) Internal Credit Rating. The designs and implementation of the first two controls appear adequate and are capable of achieving the audit objective of assessing risks prior to the purchase of solar panels for the LCS project. However, as discussed in the body of the report, our review determined these controls were not operating effectively and recommendations have been developed accordingly. The design, implementation, and operating effectiveness of the third control appears adequate and can achieve the objective of ensuring risks relating to the solar panel supplier's creditworthiness were assessed during the contract approval process in accordance with TVA-SPP-13.038, *TVA Corporate Credit Policy*. We determined there were no information systems controls significant to the audit objective.
- Interviewed TVA personnel from Major Projects, Portfolio Analytics, Civil Projects, Estimating and Project Control, Project Performance, Corporate Finance, and Corporate Credit and Insurance to gain an understanding of TVA's risk assessment processes for project management.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

TVA's Funding Authorization Matrix

The following funding authorization matrices were included in the Tennessee Valley Authority (TVA) Portfolio Management Guides, effective March 1, 2022, and November 30, 2018, and applicable during our audit period:

Phase Approvals	2022 Funding Authorization Matrix					
Phase 1 (Project Plan), Phase 2 (Project Design), Phase 3 (Project Implementation), and/or Closure Approval Total Project Cost (Capital and Operations and Maintenance)	Portfolio Manager and Project Approval Board Chair	Business Unit Controller	Project Review Board	Chief Executive Officer Direct Report	Chief Financial Officer and Chief Executive Officer	TVA Board
≥ $200M	X	X	X	X	X	X
≥ $10M	X	X	X	X	X	
≥ $5M	X	X				
< $5M	X					

Phase Approvals	2018 Funding Authorization Matrix					
Phase 2 (Project Design), Phase 3 (Project Implementation), and/or Closure Approval Total Project Cost (Capital and Operations and Maintenance)	Portfolio Manager and Business Unit Department Direct Report	Business Unit Vice President or Senior Vice President	Strategic Business Unit/Chief Executive Officer Direct Report	Project Review Board	Chief Financial Officer and Chief Executive Officer	TVA Board
≥ $50M	X	X	X	X	X	X
≥ $10M	X	X	X	X	X	
≥ $2M	X	X				
< $2M	X					

December 10, 2024
David P. Wheeler

RESPONSE TO REQUEST FOR COMMENTS – DRAFT AUDIT 2024-17481 – SOLAR PANELS PURCHASED FOR LAWRENCE COUNTY SOLAR PROJECT

Major Projects appreciates the opportunity to provide comments to the subject draft report. Our responses to the recommendations made by your staff are below.

1. Develop procedures to ensure an assessment of risk is completed and PAB and/or PRB approval is obtained prior to purchasing or providing pre-payments for long-lead procurements.
   Response – Major Projects agrees with the recommendation and had made a commitment to retrain on the SPP 34 series.

2. Verify emerging risks are included in the Project Risk and Contingency Tool prior to requesting and additional project funding approvals from the PAB and/or PRB.
   Response – Major Projects agrees with the recommendation and will report to the Enterprise Project Management Office when new risks are learned after an R3 review has been completed.

3. Develop procedures to ensure that emerging risks are included in the R3 prior the presentation to the PAB and PRB.
   Response – Major Projects agrees with the recommendation and will report to the Enterprise Project Management Office when new risks are learned after an R3 review has been completed.

As a point of clarification, Major Projects would like to specify that the "Hold" indicated in the finding "Solar Panels Procured While Project Was On Hold" was a self-imposed delay on project execution. Funding approval for long-lead procurements had been obtained through PAB/PRB and TVA Board approval for solar panel procurements had been granted.

If you have any questions or concerns, please contact Robert Kulisek, Senior Manager, Major Projects, at 423-902-6038. We appreciate the courtesy and professionalism of your staff while conducting the audit.

Roger Waldrep
Vice President
Major Projects

MNB:RPK:RTW
cc: David B. Fountain
R. Bryan Williams
Tracy E. Hightower

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