July 6, 2022

Jeremy P. Fisher

REQUEST FOR MANAGEMENT DECISION – AUDIT 2022-17343 – INFORMATION
TECHNOLOGY EQUIPMENT INVENTORY

Attached is the subject final report for your review and management decision. You are
responsible for determining the necessary actions to take in response to our findings.
Please advise us of your management decision within 60 days from the date of this report.
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 Melissa L.
Conforti, Senior Auditor, at (865) 633-7383 or Sarah E. Huffman, Director, Information
Technology Audits, at (865) 633-7345. We appreciate the courtesy and cooperation
received from your staff during the audit.

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

MLC:KDS
Attachment
cc (Attachment):
    TVA Board of Directors   Gregory G. Jackson
    Brett A. Atkins   Jeffrey J. Lyash
    Brandy A. Barbee   Jill M. Matthews
    Faisal Bhatti   Todd E. McCarter
    Andrea S. Brackett   John M. Thomas III
    Buddy Eller   Josh Thomas
    David B. Fountain   Ben R. Wagner
    Jim R. Hopson   OIG File No. 2022-17343

TVA

Office of the Inspector General

Audit Report

To the Vice President and Chief Information and Digital Officer, Technology and Innovation

INFORMATION TECHNOLOGY EQUIPMENT INVENTORY

Audit Team
Melissa L. Conforti
Frank B. Lord II
Scott A. Marler

Audit 2022-17343
July 6, 2022

<u>ABBREVIATIONS</u>

FY	Fiscal Year
IT	Information Technology
SPP	Standard Program and Process
TVA	Tennessee Valley Authority
T&I	Technology and Information
VP	Vice President
WI	Work Instruction

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APPENDIX

MEMORANDUM DATED JUNE 30, 2022, FROM ANDREA S. BRACKETT TO DAVID P. WHEELER

Why the OIG Did This Audit

An information technology (IT) asset management program is comprised of business practices that merge the physical, financial, and contractual functions required for the purchase and use of IT inventory to enable cost-efficient and timely delivery of IT services. Controls that support an effective IT asset management program include identification, deployment, tracking, and reconciliation. Ineffective IT asset management increases the risk of cyber exploit, business disruption, data loss, and potential regulatory compliance violations. IT equipment inventory is part of the IT asset management program.

During our FY 2022 IT audit planning, we performed a threat assessment and identified IT equipment inventory as an area of risk due to the potential increase of lost and stolen assets as more end-user devices are outside of Tennessee Valley Authority (TVA) offices to accommodate a more remote workforce during the COVID-19 pandemic. Additionally, data loss can occur during data migration and TVA was in the process of upgrading their IT asset management tool suite. We also identified IT inventory as higher risk during previous audits.[i] Our objective was to determine if TVA had controls and processes in place to maintain an accurate and complete inventory of IT equipment. Due to the inventory inaccuracies and control weaknesses, we did not test for inventory completeness.

What the OIG Found

Although we found access controls to IT inventory data were effective, we found TVA's controls and processes in place to maintain an accurate and complete inventory of IT equipment were ineffective. Specifically, we found IT inventory (1) records were not accurate, (2) lacked reconciliation processes, (3) lacked a deployment and tracking policy, and (4) policies and procedures were not reviewed and updated timely.

What the OIG Recommends

We made six recommendations to TVA management to ensure (1) IT inventory records are accurate, (2) IT inventory reconciliation processes are developed and implemented, (3) deployment and tracking policy requirements are documented, and (4) policies and procedures are reviewed and updated timely.

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[i] Audit Report 2020-15717, *Management of Mac Desktops and Laptops*, August 20, 2020.
Audit Report 2021-15778, *Windows® Desktop and Laptop Patching*, September 24, 2021.
Audit Report 2021-17247, *Federal Information Security Modernization Act*, November 15, 2021.

TVA Management's Comments

In response to our draft audit report, TVA management agreed with our recommendations. See the Appendix for TVA management's complete response.

BACKGROUND

An information technology (IT) asset management program is comprised of business practices that merge the physical, financial, and contractual functions required for the purchase and use of IT inventory to enable cost-efficient and timely delivery of IT services. Controls that support an effective IT asset management program include identification, deployment, tracking, and reconciliation. Ineffective IT asset management increases the risk of cyber exploit, business disruption, data loss, and potential regulatory compliance violations. IT equipment inventory is part of the IT asset management program.

In September 2021, Tennessee Valley Authority (TVA) upgraded their IT service manager and asset management tool suite to deliver a more flexible and service-oriented experience. Several processes became available within this new tool suite, including the asset management processes utilized to manage TVA's IT equipment inventory throughout their lifecycle.

During our FY 2022 IT audit planning, we performed a threat assessment and identified IT equipment inventory as an area of risk due to the potential increase of lost and stolen assets as more end-user devices are outside of TVA offices to accommodate a more remote workforce during the COVID-19 pandemic. Additionally, data loss can occur during data migration and TVA was in the process of upgrading their IT asset management tool suite. We also identified IT inventory as higher risk during previous audits.[2]

OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to determine if TVA had controls and processes in place to maintain an accurate and complete inventory of IT equipment. The scope of this audit was limited to hardware assets maintained by Technology and Innovation (T&I). Fieldwork was performed from January 2022 through May 2022. To achieve our objective, we:

- Reviewed applicable TVA Standard Programs and Processes (SPPs) and Work Instructions (WIs) to gain an understanding of TVA's policies and processes related to inventory control and maintenance of TVA's IT inventory.
   - TVA-SPP-12.003, *IT Account Management*
   - TVA-SPP-12.402, *IT Equipment Life Cycle*
   - IT-SPP-12.06.01, *Handling of Lost and Stolen TVA IT Assets*
   - IT-SPP-12.14, *IT Asset Management*
   - IT-WI-12.303, *Storage Asset Life Cycle*
   - IT-WI-12.402, *Replacement, Redeployment, Storage, Removal & Update of Personal Computing Devices*

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[2] Audit Report 2020-15717, *Management of Mac Desktops and Laptops*, August 20, 2020.
   Audit Report 2021-15778, *Windows® Desktop and Laptop Patching*, September 24, 2021.
   Audit Report 2021-17247, *Federal Information Security Modernization Act*, November 15, 2021.

- IT-WI-12.403, *Replacement, Redeployment, Storage, Removal & Update of Mobile Devices*
- IT-WI-12.404, *Replacement, Redeployment, Storage, Removal & Update of Printers/Output Devices*
- IT-WI-12.405, *Replacement, Redeployment, Storage, Removal & Update of Network Devices*
- IT-WI-12.406, *Replacement, Redeployment, Storage, Removal & Update of Servers*
- IT-WI-12.407, *Replacement, Redeployment, Storage, Removal & Update of Removable Media*
- IT-WI-12.408, *Replacement, Redeployment, Storage, Removal & Update of Non-Data Device*

- Inquired with TVA T&I personnel to gain an understanding of IT equipment inventory processes and performed walkthroughs of the IT asset management tool suite.

- Identified applicable key controls and attributes, and performed gap analysis of TVA policies and procedures addressing the IT equipment inventory process.

- Obtained inventory records from TVA's IT asset management tool suite to identify the physical computers designated as in use as of March 29, 2022.

- Analyzed the physical computer inventory records designated as in use to determine if the assets had an assigned user, owner, location, and serial number.

- Obtained an understanding of information system controls significant to our audit objective for logical access to the IT asset management tool suite. We performed a walkthrough to determine if the information system controls were effectively implemented as designed. We relied upon TVA's external auditors workpapers that concluded the controls were found to be operating effectively.

- Obtained user groups for logical access to TVA's IT asset management tool suite and judgmentally selected three of twelve user groups related to IT asset management. We reviewed the user group names and, using auditor judgement, selected those that we determined to be of higher risk. Since this was a judgmental sample, the results of the sample cannot be projected to the population. Additionally, we reviewed users in the three user groups with logical access to the IT asset management tool suite to determine if logical access was reasonable.

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.
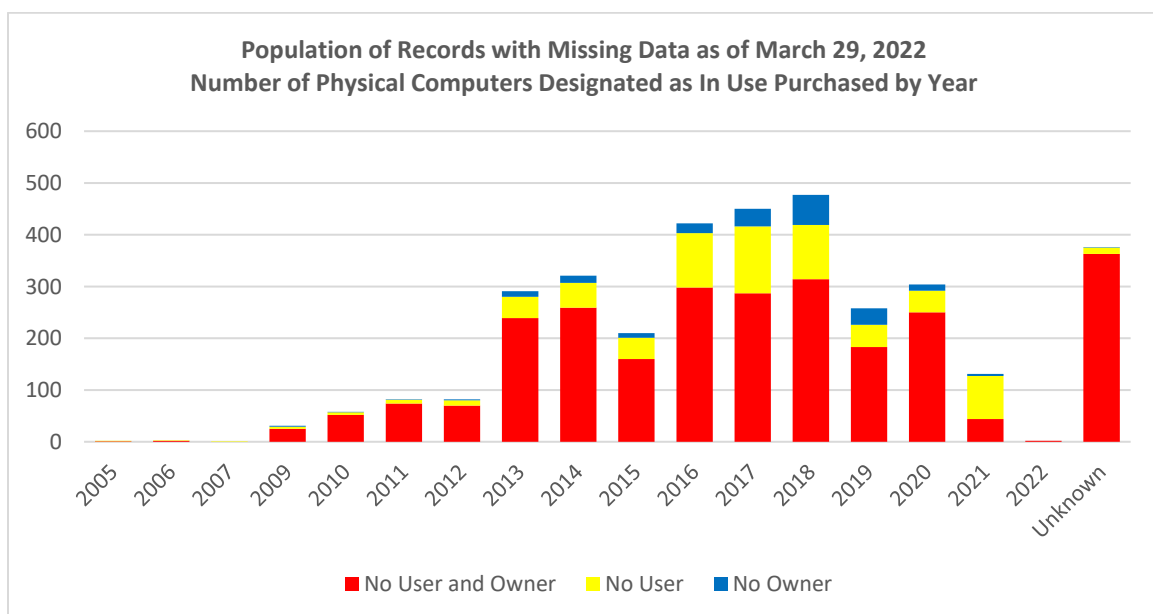
FINDINGS AND RECOMMENDATIONS

Although we found access controls to IT inventory data were effective, we found TVA's controls and processes in place to maintain an accurate and complete inventory of IT equipment were ineffective. Specifically, we found IT inventory (1) records were not accurate, (2) lacked reconciliation processes, (3) lacked a deployment and tracking policy, and (4) policies and procedures were not reviewed and updated timely. Due to the inventory inaccuracies and control weaknesses, we did not test for inventory completeness.

INACCURATE INVENTORY

We reviewed IT inventory records of 18,035 physical computers designated as in use as of March 29, 2022, for fields required in TVA policies and procedures, including assigned user, owner, and location and found IT inventory records were inaccurate. Specifically, we found:

- 678 (4 percent) inventory records did not have an assigned user, but did have an assigned owner.

- 200 (1 percent) inventory records did not have an assigned owner, but did have an assigned user.

- 2,623 (15 percent) inventory records did not have an assigned user and owner.

Chart 1 shows the timeframe in which these inventory items were purchased at TVA.

Population of Records with Missing Data as of March 29, 2022
Number of Physical Computers Designated as In Use Purchased by Year

Legend: ■ No User and Owner ■ No User ■ No Owner

Chart 1

As shown in Chart 1, the 3,501 inventory records of physical computers designated as in use that were missing data in required fields had purchase

dates ranging from 2005 to 2022. In addition, 376 had no purchase date recorded in the system.

According to TVA personnel, the reasons for the inaccuracies included:

- Shared assets that were no longer assigned owners and users. We noted the SPP had not been updated to reflect this process.

- Data migrated without owner and/or user information because the owner and/or user was inactive or missing in the previous IT asset management tool suite.

- Assets identified and logged by an automated discovery process that does not assign a user.

Inaccurate inventory records increases the risk of cyber exploit, business disruption, data loss, and potential regulatory compliance violations.

Recommendations – We recommend the Vice President (VP) and Chief Information and Digital Officer, T&I:

1. Review and update the IT inventory records to ensure users and owners are accurately assigned and maintained.

2. Update policies and procedures to reflect the current process where users and owners are no longer assigned for shared assets.

TVA Management's Comments – TVA management agreed with the recommendations. See the Appendix for TVA management's complete response.

LACK OF RECONCILIATION PROCESSES

TVA is not currently performing the hardware asset verification processes as required by IT-SPP-12.14, *IT Asset Management*. We found TVA is in the process of implementing a new automated reconciliation process for assets assigned to owners and users. However, as mentioned previously, there were inventory asset records without an assigned owner and/or user. The new automated reconciliation process also does not include assets in receiving, stockrooms, shared spaces, or surplus status, including infrastructure assets.

Identifying discrepancies between the IT asset management tool suite and what physically exists is a mitigating control for accurate and complete inventory.

Recommendation – We recommend the VP and Chief Information and Digital Officer, T&I:

3. Develop and implement policy and procedures to address reconciliation of assets without assigned users and owners, including infrastructure assets.

4. Implement policies and procedures for the automated reconciliation process for assets with assigned users and owners.

TVA Management's Comments – TVA management agreed with the recommendations. See the Appendix for TVA management's complete response.

GAPS IN TVA'S POLICIES AND PROCEDURES

We identified three gaps in TVA's policies and procedures hindering the ability to maintain a complete and accurate inventory of IT equipment. Specifically, we found no policy requirements for (1) tracking IT equipment, (2) duplicate record identification, and (3) asset identification.

- <u>Tracking IT Equipment</u>
  We found TVA has no policy requirements for tracking (1) IT hardware equipment during deployment and (2) personal computing devices and printers/output devices during replacement, redeployment, storage, or removal. Proper tracking of IT equipment prevents inadvertent disclosure of data and loss of equipment.

- <u>Duplicate Record Identification</u>
  We found no policy requirements to identify duplicate records. Controls to prevent, detect, identify, and correct duplicate inventory records can lead to accurate inventory and reporting, more informed decisions, and efficiencies.

- <u>Asset Identification</u>
  We found no policy requirements to identify and retain the unique asset identifier such as serial number when receiving or deploying IT equipment even though TVA WIs require verification of the serial number. However, we found 99.97 percent of the 18,035 physical computers designated as in use had an assigned serial number.

A lack of a deployment and tracking policy results in inconsistent application of IT asset management controls to ensure proper asset reconciliation, discovery, and records management.

Recommendation – We recommend the VP and Chief Information and Digital Officer, T&I:

5. Document policy and procedures for deployment and tracking, including identification of duplicate asset records and asset identifiers.

TVA Management's Comments – TVA management agreed with the recommendation. See the Appendix for TVA management's complete response.

POLICIES AND PROCEDURES WERE NOT REVIEWED AND UPDATED TIMELY

We found all 11 SPPs and WIs related to IT equipment were not reviewed within TVA's defined review cadence as required by TVA-SPP-01.001, *Standard Programs and Processes*. Specifically, these 11 SPPs and WIs were last updated between 2014 and 2018.

Additionally, we identified:

- One SPP referenced a cancelled WI that included outdated processes and was inconsistent with another SPP related to processing lost and stolen assets.

- One SPP and seven WIs referenced roles assigned to the Infrastructure and End User Services that no longer existed since August 2018.

- One WI referenced the previous IT asset management tool suite that was replaced in September 2021.

TVA is currently in the process of revising one of these SPPs. These issues occurred, partly, due to organizational changes. Untimely review of policies and procedures can lead to a lack of accountability and inconsistent processes and controls, which leads to ineffective asset management.

Recommendation – We recommend the VP and Chief Information and Digital Officer, T&I:

6. Review and update policies and procedures as required.

TVA Management's Comments – TVA management agreed with the recommendation. See the Appendix for TVA management's complete response.

June 30, 2022

David P. Wheeler, WT 2C-K

RESPONSE TO REQUEST FOR COMMENTS – DRAFT AUDIT 2022-17343 –
Information Technology Equipment Inventory

Our response to your request for comments regarding the subject draft report is
attached. Please let us know if your staff has any concerns with TVA's comments.

We would like to thank Sarah Huffman, Jonathan Anderson, and the audit team for their
professionalism and cooperation in conducting this audit. If you have any questions,
please contact Brett Atkins.

Andrea Brackett

Jeremy Fisher/ Andrea Brackett (delegate)
Vice President, Chief Information and Digital Officer
Technology and Innovation
SP 3A-C

ASB:BAA
cc (Attachment): Response to Request
Andrea Brackett, WT 5D-K   Joshua Thomas
Tammy Bramlett, SP 2A-C   Faisal Bhatti
Gregory Jackson   David Harrison, MP 5C-C
Benjamin Jones, SP 3L-C   Melissa Crane, SP 3A-C
Todd McCarter, MP 2C-C   OIG File No. 2022-17343
John Thomas, MR 6D-C

Audit 2022-17343
Information Technology Equipment Inventory
Response to Request for Comments

	Recommendation	Comments
1	We recommend the Vice President and Chief Information and Digital Officer, T&I: Review and update the IT inventory records to ensure users and owners are accurately assigned and maintained.	Management Agrees.
2	Update policies and procedures to reflect the current process where users and owners are no longer assigned for shared assets.	Management Agrees.
3	Develop and implement policy and procedures to address reconciliation of assets without assigned users and owners, including infrastructure assets.	Management Agrees.
4	Implement policies and procedures for the automated reconciliation process for assets with assigned users and owners.	Management Agrees.
5	Document policy and procedures for deployment and tracking, including identification of duplicate asset records and asset identifiers.	Management Agrees.