



Memorandum from the Office of the Inspector General

February 25, 2016

Scott D. Self, SP 3A-C

REQUEST FOR MANAGEMENT DECISION – AUDIT 2014-15063-06 – INFORMATION TECHNOLOGY ORGANIZATIONAL EFFECTIVENESS – ENTERPRISE SOLUTIONS DELIVERY

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.

Information contained in this report may be subject to public disclosure. Please advise us of any sensitive information in this report that you recommend be withheld.

If you have any questions or wish to discuss our findings, please contact Sarah E. Huffman, Audit Manager, at (865) 633-7345 or Colonel J. Cline, Director, Information Technology Audits, at (865) 633-7385. We appreciate the courtesy and cooperation received from your staff during the audit.

David P. Wheeler
Assistant Inspector General
(Audits and Evaluations)
ET 3C-K

SEH:BSC
Attachment
cc (Attachment):

TVA Board of Directors
Andrea S. Brackett, WT 5D-K
Trevor L. Cothron, SP 3L-C
Melissa R. Crane, SP 5D-C
J. David Gamble, WT 4D-K
Amy L. Helton, WT 5A-K
Robert G. Henry, Jr., SP 2D-C
William D. Johnson, WT 7B-K

Dwain K. Lanier, MR 3K-C
Justin C. Maierhofer, WT 7B-K
Richard W. Moore, ET 4C-K
R. Windle Morgan, WT 4D-K
Ricardo G. Perez, MR 3A-C
Regina H. Smith, SP 2D-C
Stephen B. Summers, WT 5C-K
OIG File No. 2014-15063-06



Office of the Inspector General

Audit Report

To the Chief Information
Officer, Information
Technology

INFORMATION TECHNOLOGY ORGANIZATIONAL EFFECTIVENESS – ENTERPRISE SOLUTIONS DELIVERY

Audit Team
Sarah E. Huffman
Scott A. Marler

Audit 2014-15063-06
February 25, 2016

ABBREVIATIONS

Agile	Scaled Agile Framework
CIO	Chief Information Officer
COBIT	Control Objectives for Information and Related Technology
ECM	Enterprise Content Management
EDW	Enterprise Data Warehouse
ESD	Enterprise Solutions Delivery
IT	Information Technology
IT1K	1,000 Days to Success
OIG	Office of the Inspector General
TVA	Tennessee Valley Authority

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
BACKGROUND.....	1
OBJECTIVES, SCOPE, AND METHODOLOGY	2
FINDINGS	3
CURRENT ORGANIZATIONAL STATE.....	3
TVA VALUES	3
IT1K INITIATIVE	4
RECOMMENDATIONS.....	5

APPENDICES

- A. TVA VALUES
- B. OPERATIONAL MATURITY LEVELS
- C. MEMORANDUM DATED MARCH 1, 2016, FROM SCOTT D. SELF TO DAVID P. WHEELER (RECEIVED VIA E-MAIL FEBRUARY 24, 2016)



Audit 2014-15063-06 – Information Technology Organizational Effectiveness – Enterprise Solutions Delivery

EXECUTIVE SUMMARY

Why the OIG Did This Audit

In 2008, the Tennessee Valley Authority's (TVA) Office of the Inspector General (OIG) performed an auditⁱ on the effectiveness of the Information Technology (IT) organization and made several recommendations for improvements. In 2011, TVA OIG completed a follow-up auditⁱⁱ and determined the actions taken were not carried through year to year, and as a result, effectiveness in many areas decreased. In addition, TVA's former Chief Information Officer (CIO) created a program titled 1,000 Days to Success (IT1K) to address findings from the 2011 audit as well as other observations he made as to the current state of IT, which included an initiative related to enterprise data warehouse (EDW).

In December 2013, IT informed us it had completed the management action plans to address the recommendations from Audit 2010-13366. Soon thereafter, IT informed us it had also completed implementation of the IT1K program. To assess the results of the management action plans, the IT1K program, and determine the current organizational effectiveness of IT, we scheduled follow-up audits of the individual operational groups within IT. This report covers our audit of Enterprise Solutions Delivery (ESD).

ESD has primary responsibility for the development and support of TVA's IT corporate applications portfolio and ensuring these systems provide true business value. ESD's organizational structure includes five teams. One team, Enterprise Projects and Support, supports the ESD team and projects with a staff of Business Analysts. Another team, Enterprise Services, is comprised of several groups responsible for information solutions, software architecture and integration, collaboration and content solutions, and content management. The remaining three teams are organized by TVA service line and include support for Financial and Shared Services, Human Resources and Accounting Solutions, and Enterprise Asset and Work Management.

The OIG performed this audit to determine ESD's (1) current effectiveness, (2) actions completed in the implementation of IT1K initiatives related to the EDW, and (3) design of the IT1K program and identify gaps related to any outcomes not met.

ⁱ Audit Report 2007-11348, Information Services Organizational Effectiveness, March 27, 2008.

ⁱⁱ Audit Report 2010-13366, Information Technology Organizational Effectiveness, April 5, 2011.



Audit 2014-15063-06 – Information Technology Organizational Effectiveness – Enterprise Solutions Delivery

EXECUTIVE SUMMARY

What the OIG Found

We conducted a current state assessment on ESD and determined operational maturity to be a 3 (defined) considering it is working towards having the ability to establish, monitor, and adjust processes to improve service delivery through the implementation of the Scaled Agile Frameworkⁱⁱⁱ (Agile).



* ESD was not assessed in Audit 2010-13366, therefore, results are based only on current state.

Figure 1

Definitions of the maturity ratings for Figure 1, which were developed from the Control Objectives for Information and Related Technology (COBIT)^{iv} 4.1 framework, are summarized below and described in detail in Appendix B.

- 0. Nonexistent – There is a complete lack of policies and processes.
- 1. Initial/Ad Hoc – There are no standardized policies and processes.
- 2. Repeatable and Intuitive – Policies and processes are developed; however, there is a high reliance on the knowledge of individuals to ensure compliance.
- 3. Defined – Policies and processes have been standardized, but it is unlikely that noncompliance would be detected.
- 4. Managed and Measurable – Management monitors and measures compliance with procedures and takes action where processes appear not to be working effectively. Automation and tools are used in a limited or fragmented way.
- 5. Optimized – Processes have been refined to a level of good practice, based on the results of continuous improvement and maturity modelling with other enterprises.

While ESD’s operational maturity is well defined, there are opportunities to improve efficiencies in the documentation of IT development work. In

ⁱⁱⁱ The Scaled Agile Framework is an alternative to traditional project management. Agile emphasizes empowering people to collaborate and make decisions in addition to continuous planning, continuous testing, and continuous integration.

^{iv} COBIT is an IT governance framework and supporting toolset that emphasizes regulatory compliance, helps organizations to increase the value attained from IT, enables alignment, and simplifies implementation of the enterprises' IT governance and control framework.



Audit 2014-15063-06 – Information Technology Organizational Effectiveness – Enterprise Solutions Delivery

EXECUTIVE SUMMARY

In addition, EDW efforts planned within the IT1K initiatives were not fully implemented as originally planned.

TVA's values are the fundamental beliefs used to guide the actions, behaviors, and decisions in how to achieve its mission. TVA has recently adopted the following values that are being introduced to employees: safety, service, integrity, accountability, and collaboration. Observed activities within ESD were consistent with TVA values, with the exception of one team. According to TVA, IT management is aware of the challenges within this team and has plans in progress to improve team dynamics and collaboration.

What the OIG Recommends

The TVA OIG recommends the CIO, IT:

1. Evaluate current software development practices and procedures to identify opportunities to streamline the documentation process to improve efficiency.
2. Continue working with Enterprise Content Management leadership to address identified team issues.
3. Continue EDW efforts as planned in response to the IT1K initiative.

TVA Management's Comments

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

BACKGROUND

A key aspect of the Tennessee Valley Authority's (TVA) mission and vision is to provide affordable electricity to rate payers. TVA's Information Technology (IT) organization's contribution to this mission and vision includes operating effectively. In 2008, TVA's Office of the Inspector General (OIG) performed an audit¹ on the effectiveness of the IT organization and made several recommendations for improvements. In 2011, the OIG completed a follow-up audit² and determined the actions previously taken were not carried through year to year, and as a result, effectiveness in many areas decreased. Accordingly, to assist IT in increasing its effectiveness, the recommendations from Audit 2010-13366 were focused on creating sustainable processes. In addition, TVA's former Chief Information Officer (CIO) created a program titled 1,000 Days to Success (IT1K) to address findings from the audit as well as other observations he made as to the current state of IT.

In December 2013, IT informed us it had completed the management action plans to address the recommendations from Audit 2010-13366. Soon thereafter, IT informed us it had also completed implementation of the IT1K program. To assess the results of the management action plans, the IT1K program, and to determine current organizational effectiveness, a follow-up audit was scheduled. To accomplish this, we planned to evaluate the effectiveness of individual operational groups within IT. This report covers the results for our audit of the IT Enterprise Solutions Delivery (ESD) organization.

ESD provides business solution development, delivery, and governance for TVA's corporate organizations and enterprise applications. ESD's organizational structure includes five teams. One team, Enterprise Projects and Support, oversees new emerging work requests, application portfolio management, and business analysis functions. Another team, Enterprise Services, supports ESD as well as other IT and TVA organizations by providing software architecture and integration, business intelligence, and content management. The remaining three teams are organized by TVA service line support for Financial and Shared Services, HR and Accounting Solutions, and Enterprise Asset and Work Management.

ESD had the responsibility for sustaining the enterprise data warehouse (EDW) from the IT1K program. The objectives of this initiative included establishing architectural framework, processes, and standards; establishing governance and prioritization framework; filling data processing gaps; preparing road maps to prioritize high-value initiatives; and implementing data quality tools and metadata framework.

¹ Audit Report 2007-11348, Information Services Organizational Effectiveness, March 27, 2008.

² Audit Report 2010-13366, Information Technology Organizational Effectiveness, April 5, 2011.

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of this audit were to evaluate the effectiveness of organizations within IT in meeting TVA's mission and values (see Appendix A). To accomplish this, the audit team (1) evaluated current effectiveness of operational groups within IT, (2) validated the outcomes of management action plans and whether the IT1K program met expectations, (3) evaluated the implementation of management action plans and the IT1K program in relation to achieving outcomes, and (4) reviewed the design of the management action plans and IT1K program for gaps related to any outcomes not met. The scope of this report covers the results for IT ESD. Additional reports were completed for each operational group in IT.³

To achieve the objectives of this audit, the audit team:

- Interviewed a sample of ESD employees to determine background, understanding of job duties, team dynamics, and leadership capabilities.
- Reviewed the work performed to complete IT1K initiatives.

Sample selections for interviews were performed using random methods and auditor judgment based on position, title, and location on the IT organization chart. Due to the use of nonstatistical sampling, we cannot project the sample results to the population.

Documentation (e.g., value definitions, IT1K objectives, and outcomes) used for this audit was provided by TVA. Fieldwork for this audit was completed between August and December 2015.

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.

³ Audits have been completed for the following five operational groups in IT:

- Audit Report 2014-15063-01, Enterprise Information Security and Policy, June 4, 2015.
- Audit Report 2014-15063-02, Enterprise Architecture and Programs, August 4, 2015.
- Audit Report 2014-15063-03, Operations Solutions Delivery, September 3, 2015.
- Audit Report 2014-15063-04, Enterprise Customer Operations, September 22, 2015.
- Audit Report 2014-15063-05, Infrastructure Delivery, January 12, 2016.

FINDINGS

ESD's operational maturity is a 3 (defined) considering it is working towards having the ability to establish, monitor, and adjust processes to improve service delivery through the implementation of the Scaled Agile Framework⁴ (Agile) as shown in Figure 1. Definitions of the maturity ratings for Figure 1, which are developed from the Control Objectives for Information and Related Technology (COBIT) 4.1 framework, are described in detail in Appendix B.



* ESD was not assessed in Audit 2010-13366, therefore, results are based only on current state.

Figure 1

CURRENT ORGANIZATIONAL STATE

TVA's IT has adopted Agile for the delivery of services. ESD is in the process of implementing this framework and is working towards the ability to establish, monitor, and adjust processes to improve service delivery.

ESD provides support for applications critical to TVA business including human resources, payroll, time reporting, learning management, enterprise asset management, and enterprise financial management. A sample of TVA business customers within ESD service lines spoke highly of the level of collaboration and communication between IT and the business in support of critical applications.

Considering the critical nature of the applications supported by ESD, development work on production systems requires detailed documentation. ESD staff reported they are required to document work in as many as four different systems for ticketing, task tracking, software service requests, and additional change documentation. Developers stated that maintaining documentation requirements in the separate systems has resulted in inefficiencies and duplication. IT currently has a project in place to review development processes and tools with requirements for increased integration between existing systems.

TVA VALUES

TVA's values are the fundamental beliefs used to guide the actions, behaviors, and decisions in how to achieve its mission. Observed activities within ESD were consistent with TVA values, with the exception of the Enterprise Content

⁴ The Scaled Agile Framework is an alternative to traditional project management. Agile emphasizes empowering people to collaborate and make decisions in addition to continuous planning, continuous testing, and continuous integration.

Management (ECM) records management team. According to TVA, IT management is aware of the challenges within this team and has plans in progress to improve team dynamics and collaboration.

Integrity

The TVA value of integrity is defined as conducting business according to the highest ethical standards and earning the trust of others through words and actions that are open, honest, and respectful. There is a history of disrespectful interaction and poor communications within the ECM records management team that has negatively impacted team trust and morale. In addition, there is a perception of favoritism by management in the past.

Accountability

In alignment with the TVA value accountability, producing effective results includes being accountable for all process deliverables. Through adoption of the Agile process, ESD implemented the concept of sprints, where tasks are prioritized to be completed within a specific time frame and the teams are held accountable to these schedules.

Collaboration

Generally, ESD staff reported good collaboration within most teams and across the IT organization. In addition, ESD and its customers collaborate to prioritize support and project tasks as part of the Agile process.

However, within ESD, the ECM records management team reported issues with team collaboration, both within their team and with the ECM implementation project team. These issues include how to support and use functionality in the two different documentation systems they support. In addition, there is poor team communications which are magnified by the team's trust and morale issues.

IT1K INITIATIVE

ESD was responsible for the IT1K initiative related to establishing an EDW framework. While some portions of the IT1K deliverable for the EDW framework have been completed, a majority of the work is still ongoing. Planned ongoing activities include:

- Completing architectural framework, processes, and standards.
- Updating roadmaps and implementing prioritized initiatives.
- Implementing enterprise metadata framework.
- Ensuring data quality through continued incorporation of data quality tools.

RECOMMENDATIONS

The TVA OIG recommends the CIO, IT:

1. Evaluate current software development practices and procedures to identify opportunities to streamline the documentation process to improve efficiency.
2. Continue working with ECM leadership to address identified team issues.
3. Continue EDW efforts as planned in response to the IT1K initiative.

TVA Management's Comments – In response to our draft audit report, TVA management agreed with our findings and recommendations. See Appendix C for TVA management's complete response.

TVA VALUES

The Tennessee Valley Authority (TVA) values are fundamental beliefs that guide TVA's actions, behaviors, and decisions. TVA has defined the following values:

- **Safety:** We share a professional and personal commitment to protect the safety of our employees, our contractors, our customers, and those in the communities that we serve.
- **Services:** We are privileged to be able to make life better for the people of the Valley by creating value for our customers, employees, and other stakeholders, being good stewards of the resources that have been entrusted to us, and by being a good neighbor in the communities in which we operate.
- **Integrity:** We conduct our business according to the highest ethical standards and seek to earn the trust of others through words and actions that are open, honest, and respectful.
- **Accountability:** We take personal responsibility for our actions, our decisions, and the effectiveness of our results, which must be achieved in alignment with our company values.
- **Collaboration:** We're committed to fostering teamwork, developing effective partnerships, and valuing diversity as we work together to achieve results.

OPERATIONAL MATURITY LEVELS

Operational maturity levels were determined using Control Objectives for Information and Related Technology (COBIT) 4.1 operating standards as shown in Figure 1. COBIT 4.1 is an information technology (IT) governance framework and supporting toolset created by ISACA that allows managers to bridge the gap between control requirements, technical issues, and business risks. COBIT emphasizes regulatory compliance, helps organizations to increase the value attained from IT, enables alignment, and simplifies implementation of the enterprises' IT governance and control framework.

Rating	Summary Criteria
5 Optimized	IT policies and processes have been refined to a level of good practice, based on the results of continuous improvement and maturity modeling with other enterprises.
4 Managed and Measurable	Management monitors and measures compliance with IT policies and processes and takes action where processes appear not to be working effectively. Processes are under constant improvement and provide good practice. Automation and tools are used in a limited or fragmented way.
3 Defined	IT policies and processes are standardized, documented, and communicated. Management has mandated these processes should be followed; however, it is unlikely deviations will be detected. The procedures themselves are not sophisticated but are the formalization of existing practices.
2 Repeatable but Intuitive	IT policies and processes have developed to the stage where similar procedures are followed by different Strategic Business Units. There is a high degree of reliance on the knowledge of individuals.
1 Initial/Ad Hoc	There are no standardized IT policies and processes; instead, there are ad hoc approaches that tend to be applied on an individual or case-by-case basis.
0 Nonexistent	Complete lack of any recognizable IT policies and processes.

Figure 1

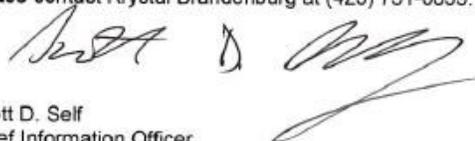
March 1, 2016

David P. Wheeler, ET 3C-K

RESPONSE TO REQUEST FOR COMMENTS – DRAFT AUDIT 2014-15063-06 –
INFORMATION TECHNOLOGY ORGANIZATIONAL EFFECTIVENESS - ENTERPRISE
SOLUTIONS DELIVERY

Our response to your request for comments regarding the findings of 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 Colonel Cline, Sarah Huffman, and the audit team for their professionalism and cooperation in conducting this audit. If you have any questions, please contact Krystal Brandenburg at (423) 751-6039.



Scott D. Self
Chief Information Officer
Information Technology
SP 3A-C

cc (Attachment):

Andrea S. Brackett, WT 5D-K
Krystal R. Brandenburg, MP 3C-C
Paula S. Brockhoff, MP 5H-C
Trevor L. Cothron, SP 3L-C
Melissa R. Crane, SP 5D-C
Clay Deloach, Jr., SP 3L-C
J. David Gamble, WT 4D-K
Amy L. Helton, WT 5A-K
Robert G. Henry, Jr., SP 2D-C

Dwain K. Lanier, MR 3K-C
Keith G. Madison, SP 5D-C
R. Windle Morgan, WT 4D-K
Ricardo G. Perez, LP 3R-C
Philip D. Propes, MP 2B-C
Regina H. Smith, SP 2D-C
Stephen B. Summers, WT 5C-K
OIG File No. 2014-15063-06

AUDIT 2014-15063-06
Information Technology Organizational Effectiveness - Enterprise Solutions Delivery
Response to Request for Comments

ATTACHMENT A
Page 1 of 1

	Recommendation	Comments
1	The TVA OIG recommends the CIO, IT: Evaluate current software development practices and procedures to identify opportunities to streamline the documentation process to improve efficiency.	Management agrees.
2	Continue working with Enterprise Content Management leadership to address identified team issues.	Management agrees.
3	Continue EDW efforts as planned in response to the IT1K initiative.	Management agrees.