U.S. COMMODITY FUTURES TRADING COMMISSION
Office of the Inspector General
Office of Audits

Audit of CFTC's Enterprise Architecture Program

Report Number: 17-AU-03

U.S. Commodity Futures Trading Commission
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FROM: Miguel A. Castillo, *CPA, CRMA*
Assistant Inspector General, Auditing

DATE: December 18, 2017

SUBJECT: Audit of CFTC's Enterprise Architecture Program

INTRODUCTION

Since Fiscal Year 2011 (FY2011), Congress has annually earmarked $35 million to $50 million of CFTC's total appropriation for information technology (IT) spending (IT earmark). CFTC IT earmarks total $277 million.[1]

Appropriations language for the IT earmark has varied. Congress has appropriated the IT earmark "for the highest priority information technology activities" (FY2011),[2] "for information technology investments" (FY2012, FY2013),[3] and, most recently, "for the purchase of information technology" (FY2014-FY2017).[4]

Throughout this period, appropriations explanatory language indicates that Congress intended the IT earmarks to be used for investments in information technology necessary to monitor markets under jurisdiction of the CFTC.[5]

[1] However, for FY2012, Congress authorized the transfer of $10 million from the IT earmark to pay CFTC salaries and benefits. P.L. 112-74, § 744 (Dec. 23, 2011).
[2] P.L. 112-10 (Apr. 15, 2011)
[3] P.L. 112-55 (Nov. 18, 2011); P.L. 113-6, § 1313 (Mar. 26, 2013) (continuing resolution).
[4] P.L. 113-76 (Jan. 17, 2014); P.L. 113-235 (Dec. 16, 2014); P.L. 114-113 (Dec. 18, 2015); P.L. 115-31 (May 5, 2017).
[5] See Appendix E for a discussion of legislative intent.

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In addition, discrete former CFTC Commissioners, including one former Commissioner who had been heavily involved with CFTC information technology issues both while working in Congress and while serving as a CFTC Commissioner, expressed strong views in line with the legislative history.[6]

In order to, among other things, evaluate how CFTC spent and planned to invest the FY 2017 IT earmark, the Office of Inspector General (OIG) initiated an audit of the U.S. Commodity Futures Trading Commission (CFTC) Enterprise Architecture (EA) program required under the Clinger-Cohen Act (CCA).[7] EA is the description and documentation of the current and desired relationships among program, business, and management processes, and IT processes. It describes the "as is" (current state) architecture and the "to be" (future state) architecture, and includes the rules, standards, and systems life cycle information to optimize and maintain the environment which the agency creates and maintains by managing its IT portfolio. It is approved by an EA steering committee, an investment review board, or the Chairman. We anticipated the CFTC EA Program would explain how and why the IT earmark was spent.

Our audit objective(s) were to assess and evaluate EA program practices. We examined EA program practices in detail to determine whether CFTC: (1) established an adequate baseline and a target enterprise architecture; (2) implemented effective management practices, policies, and processes for the development, implementation, maintenance, and oversight of the EA program; and, given annual Congressional IT earmarks, (3) reported IT investment results from this program.

[6] Testimony of CFTC Commissioner Scott D. O'Malia Before the US House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies (April 12, 2013)("I appreciate Congress setting aside specific funding levels since FY 2011 to encourage the Commission to focus on technology as a key component of its surveillance and oversight program, but we have a very long way to go to develop a credible, detailed business plan that focuses on how both staff and technology resources are integrated to meet mission objectives." Commissioner O'Malia also asserted that most of the IT earmark for FY2012 through FY2014 was not spent on "new cutting-edge technology"); Keynote Address by Commissioner Scott D. O'Malia at the Federal Reserve Bank of New York (July 15, 2014)("I am pleased that the House Appropriations Subcommittee on Agriculture provided the CFTC with $52.6 million for technology investments for Fiscal Year (FY) 2015. Such an investment would allow the CFTC to begin making the necessary investments to keep up with technological innovation in today's electronic and highly automated markets"). We note two former Commissioners dissented to CFTC's reported FY2011 technology spending; see, CFTC, Fiscal Year 2011 Annual Performance Report, Statement of Dissent by Commissioner Jill E. Sommers and Commissioner Scott D. O'Malia (Feb. 3, 2012)("Some of the most notable goals which have been missed are in the areas of technology.... Due to the massive growth in the speed and volume of trades the Commission must embrace technology or risk being unable to effectively monitor futures, options and swaps markets").

[7] Clinger-Cohen Act (a.k.a. the Information Technology Management Reform Act of 1996), P.L. 104-106, 110 STAT. 679 (1996).

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CONCLUSIONS

CFTC does not have a formal EA program. In 2003, management hired an enterprise architect for program development and reassigned him to another ODT branch in 2015. To date, CFTC has not reestablished an EA leadership position to fulfill program responsibilities and agency compliance.

The lack of an organizational commitment to an EA program is long-standing,[8] and limits CFTC's ability to ensure that IT initiatives are properly planned, selected, prioritized, justified, and cost-beneficial, and in compliance with applicable statutes and directives. These challenges may be especially significant given ODT currently operates with 279 staff and contractors.[9] Refer to **APPENDIX A** for EA background and our assessment of CFTC's enterprise architecture maturity.

While CFTC does not have a formal EA program, its Office of Data and Technology (ODT) uses basic standards of governance such as project investment review and lifecycle management that are steps in the right direction. ODT's efforts, however, do not fulfill the requirements of an EA program because CFTC has not formalized an EA program and technology capital planning,[10] policies, and procedures at appropriate levels that permit description of current and future state architectures and associated funding. Thus, this limits the reach of CFTC to effectively govern an EA program; CFTC will not be able to readily measure how IT spending benefits its mission, right-size cyber-security investment costs, or quantify program benefits achieved. Refer to **APPENDIX B** for further details.

Lastly, given the lack of an EA program with investments directed toward a target architecture, CFTC may not applicably report that it has complied with the CCA, nor that it spent the $50 million FY2017 IT earmark consistent with Congress' apparent intent. While the FY2017 IT earmark was "for the purpose of information technology,"[11] we note the relevant legislative history:

> The Committee highlights the crucial need for the CFTC to make ***mission-critical investments in technology*** to sort through the vast

[8] See, Opening Statement of Commissioner Scott D. O'Malia, 12th Meeting of the Technology Advisory Committee, Washington, DC (June 3, 2014)("*So far, the Commission has had little luck in developing its own strategic plan to implement a mission-specific technology roadmap that takes into account this trading reality* ['evolving and complex market structures related to automated trading']").
[9] Refer to APPENDIX H for a recent ODT organizational chart showing 87 CFTC staff and 212 contractors.
[10] OMB A-11 Section 31.8, *Management Improvement Initiatives and Policies, Capital Planning and Investment Control.*
[11] P.L. 115-31 (May 5, 2017).

> volume of data and information generated daily by markets. The CFTC's responsibilities to conduct effective oversight and analysis of the swaps and futures markets requires greater attention to and investments in its information technology systems.[12]

The legislative history suggested the FY2017 IT earmark was for IT investments and did not suggest its expenditure for daily IT operations. We analyzed actual spending of the FY2017 earmark and learned that 61% percent of CFTC's FY 2017 IT earmark supported daily IT operations. Refer to **APPENDIX C** for further details.

ODT management conveyed that prior Commission leadership prioritized the hiring and assignment of staff to focus on writing and implementing Dodd-Frank[13] rules. Given limited resources, ODT management focused on IT security at the expense of maturing an EA program.

RECOMMENDATIONS

To establish accountability for Congressional appropriations earmarked for IT spending, we recommend the Commission comply with CCA as follows:

1. Formalize leadership for an EA program with responsibilities for a future-state roadmap that aligns with mission operations;

2. Establish a review board made up of the Chairman, Commissioners, and Division Directors, to prioritize and approve IT investments; and

3. Establish IT investment performance measures to monitor investment status, and periodically report progress to Congress.

We prepared this audit in accordance with *Generally Accepted Government Auditing Standards*[14] issued by the Government Accountability Office (GAO). A detailed description of the objective, scope and methodology can be found in

[12] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, S. Rpt. 114-280, page 74-75, 114th Cong. 2d Sess (June 16, 2016). Similar IT earmark legislative history exists for FY2011 through FY2016, as detailed in Appendix E.
[13] Dodd-Frank Wall Street Reform and Consumer Protection Act, P.L. 111-203 (July 21, 2010). We note that Congress established the requirement to establish an EA Program in 1996.
[14] Government Accountability Office (GAO) Generally Accepted Government Auditing Standards (GAGAS) Revision 2011.

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APPENDIX D. We will publish this report on the Office of the Inspector General's web page and the report will be summarized in our March 2018 *Semiannual Report to Congress*. If you have any questions, please contact me at (202) 418-5084 or Branco Garcia, lead auditor, at (202) 418-5013.

CC:

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SUMMARY MANAGEMENT COMMENTS

In principal, management concurred with the general findings and recommendations recognizing the value of Enterprise Architecture (EA) as enacted in the Clinger-Cohen Act and the E-Government Act of 2002. While management concurs that it does not have a formal EA program, it asserts it has implemented key EA functions and governance to ensure alignment of Information Technology (IT) investments with mission objectives. Thus, these efforts have enabled the Commission to function in compliance with the spirit of the Clinger-Cohen Act and consistent with the goals of a formal EA program.

During the fieldwork for our audit, and perhaps in anticipation of our recommendations, management established an IT Investment Review Board (ITIRB) comprised of Division Directors, leadership from supporting offices, and senior leaders. The ITIRB will provide executive decision-making on, and oversight of, CFTC IT investment planning and management and to ensure compliance with the statutory and regulatory direction from Congress, the Office of Management and Budget (OMB) and other applicable Federal oversight entities. The ITIRB will prioritize and approve IT investments, which is a core part of a formal EA program. The first ITIRB meeting is planned for January 2018.

Management also plans to submit an unfunded request to staff an Enterprise Architect position that, if funded, will lead the formal documentation of the future state roadmap that aligns with mission operations. Lastly, management conveyed that it is actively developing the FY19-FY23 IT Strategic Plan, and will define performance measures necessary to achieve strategic objectives. Management comments in its entirety are presented in Appendix G.

EVALUATION OF MANAGEMENT COMMENTS

Management's actions and plans are responsive to the recommendations made in the report.

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APPENDIX A

EA MATURITY ASSSESSMENT

BACKGROUND: THE CLINGER-COHEN ACT, ENTERPRISE ARCHITECTURE REQUIREMENTS, AND EVALUATION CRITERIA

In 1996, Congress enacted the *Clinger-Cohen Act (CCA)*,[15] and later passed the *E-Government Act of 2002*,[16] which requires executive agencies[17] to develop, maintain, and facilitate the implementation of an effective EA program. By doing so, agencies can ensure that they efficiently spend limited information technology (IT) resources on systems that best support the executive agency's mission and strategic goals.[18]

In September 1999, the Federal Chief Information Officers (CIO) Council[19] published the Federal Enterprise Architecture Framework (FEAF)[20] to provide agencies with a common construct for their architectures, and to facilitate the coordination of system investments across agencies. In May 2012, the Office of Management and Budget (OMB) *Common Approach to Federal Enterprise Architecture Framework (Common Approach)*[21] elaborated that the Clinger-Cohen Act and OMB policies require executive agency heads to develop and maintain an agency-wide enterprise architecture that integrates strategic drivers, business requirements, and technology solutions. The Common Approach promotes increased levels of mission effectiveness by standardizing the development and use of architectures within and between agencies. This includes principles for using EA to help agencies eliminate waste and duplication, increase shared services, close performance gaps, and promote engagement among government, industry, and citizens.

[15] Clinger-Cohen Act (a.k.a. the Information Technology Management Reform Act of 1996), P.L. 104-106, 110 STAT. 679 (1996).
[16] E-Government Act of 2002, P.L. 107-347, 116 STAT. 2899 (2002).
[17] Per CCA, "executive agency" is defined as follows: The term "executive agency" has the meaning given that term in section 4(1) of the Office of Federal Procurement Policy Act (41 U.S.C. 403(1)). We interpret CCA's definition to include CFTC.
[18] The Government Performance and Results Modernization Act of 2010, P.L. 111-352, 124 STAT. 3866 (2011), addresses agency strategic plans.
[19] The Federal CIO Council is the principal interagency forum on the improvement of agency practices related to use of Federal information resources.
[20] A framework is a high-level process that is not prescriptive, but that provides a method for the implementation of EA in a uniform way. FEAF includes requirements for change drivers—business needs, such as new missions or assumption of large plans, and technical needs, such as unsupported platforms or obsolescence. FEAF was most recently updated in 2013.
[21] US Executive Office of the President, Common Approach to Federal Enterprise Architecture, page 3, n.1 (and accompanying text) (May 2012).

OMB made clear that an overall EA program also should support all program offices in meeting strategic objectives by enhancing flexibility and interoperability across information systems, reducing redundancies, and improving access to accurate, timely, and consistent information. An EA program establishes a baseline and target architecture, and transition plans for program management and investment decisions. Sections 53 and 300 of OMB Circular A-11, *Preparation, Submission, and Execution of the Budget*,[22] and Circular A-130, *Management of Federal Information Resources*,[23] establish policy for the management of Federal information resources, and require agencies to align their IT investments to their EA.

CFTC LACKS AN EA PROGRAM

Using GAO's evaluation criteria,[24] we concluded that CFTC lacks an EA program. As depicted in Table 1, there are some ad hoc EA activities, albeit unstructured and lacking institutional leadership. This result corresponds to Maturity Stage *0 - Creating EA Awareness*, given that CFTC does not demonstrate an awareness of the management discipline needed to successfully develop, maintain, and use an EA.

[22] OMB Circular A-11, Preparation, Submission and Execution of the Budget.
[23] OMB Circular A-130, Management of Federal Information Resources.
[24] Government Accountability Office (GAO) – Organizational Transformation, A Framework for Assessing and Improving Enterprise Architecture Management (Version 2.0) (GAO 10-846G).

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Table 1: *Assessment Results of CFTC's Enterprise Architecture (EA) Efforts against GAO's EA Management Maturity Framework.*[25]

GAO Maturity Stage	GAO Core Element	OMB Capability Area[26]	Description	Assessment Satisfied? (Yes/No)[27]
0	**Creating EA Awareness** While Stage "0" organizations may have initiated some EA activity; their efforts are largely ad hoc and unstructured and lack the institutional leadership necessary for successful EA development, maintenance, and use as defined in Stage 1. Therefore, Stage 0 has no associated core elements.			
1	**Establishing EA Institutional Commitment and Direction**			
	1	Use	Written and approved organization policy exists for EA development, maintenance, and use.	No
	2	Use	Executive committee representing the enterprise exists and is responsible and accountable for EA.	No
	3	Use	Executive committee is taking proactive steps to address EA cultural barriers.	No
	4	Use	Executive committee members are trained in EA principles and concepts.	No
	5	Use	Chief architect exists. **OIG Evaluation:** Architect on staff not assigned program responsibility.	No
	6	Use	EA purpose is clearly stated.	No
	7	Use	EA framework(s) is adopted.	No
	8	Results	EA performance and accountability framework is established.	No
2	**Creating the Management Foundation for EA Development and Use**			
	9	Use	EA budgetary needs are justified and funded.	No
	10	Use	EA program office exists.	No
	11	Use	Key program office leadership positions are filled.	No
	12	Use	Program office human capital plans exist.	No

[25] Id.
[26] OMB Capability Area column represents the three capability areas (Completion, Use, Results) described in OMB's EA Assessment Framework (2009). Therefore, this attribute demonstrates how GAO and OMB's EA frameworks are fundamentally aligned and substantially consistent.
OMB's definition of each of the capability areas are summarized as follows:
Completion: The extent to which an agency has developed an integrated, organization wide architecture, in terms of business, performance, data, services, technology, and security, as well as a comprehensive enterprise transition plan.
Use: The extent to which the agency has established key management practices, processes, and policies needed for developing, maintaining, and overseeing its architecture, and for demonstrating both the importance of architecture awareness and the value of employing architecture practices; it also assesses the extent of the agency's use of its architecture to inform strategic planning, program performance improvement planning, information resources management, IT management, and capital planning and investment control processes.
Results: The extent to which the agency is measuring the effectiveness and value of its architecture activities by assigning performance measurements to its architecture and related processes, and reporting on actual results to demonstrate architecture success.
[27] To determine the assessment results (Yes/No), we compared CFTC's existing elements of EA (see column title "Description") against GAO's core elements and OMB capability area(s).

GAO Maturity Stage	GAO Core Element	OMB Capability Area[26]	Description	Assessment Satisfied? (Yes/No)[27]
	13	Use	EA development and maintenance methodology exists.	No
	14	Use	Automated EA tools exist.	No
	15	Use	EA program management plan exists and reflects relationships with other management disciplines.	No
	16	Use	Work breakdown structure and schedule to develop EA exist.	No
	17	Completion	EA segments, federation members, and/or extended members have been identified and prioritized.	No
	18	Results	Program office readiness is measured and reported.	No
3			**Developing Initial EA Versions**	
	19	Use	Organization business owner and CIO representatives are actively engaged in architecture development. **ODT Note:** The most developed parts are the physical infrastructure architecture and data architecture. There are several architectural deliverables that have either been developed or being developed such as target state network diagrams, database configurations, data dictionaries and guidebooks as well as current state data models. **OIG Evaluation**: Approved EA plan with mission input not designed.	No
	20	Use	EA human capital plans are being implemented.	No
	21	Use	Program office contractor support needs are being met.	No
	22	Use	Program office staff is trained in EA framework, methodology, and tools.	No
	23	Use	Methodologies and tools exist to determine investment compliance with corporate and subordinate architectures. **ODT Note:** Using the practically developed architecture, all investments and spends are analyzed on an ongoing basis by the IT Leadership to ensure that the investments are aligned with the long-term strategic goals as outlined the Agency's strategic plan as well as the IT strategic plan. **OIG Evaluation**: Our review of the *CFTC Information Technology Strategic Plan 2014-2018*, December 2014, acknowledges that projects are listed by goal. The plan does not identify Capital Planning Investment Controls (CPIC) or Key Performance Measures (KPI). CPIC ensures requirements are driven by mission rather than IT Leadership and KPIs provide for technology investment accountability.	No

GAO Maturity Stage	GAO Core Element	OMB Capability Area[26]	Description	Assessment Satisfied? (Yes/No)[27]
	24	Use	Methodologies and tools exist to determine subordinate architecture alignment with the corporate EA.	No
	25	Use	EA-related risks are proactively identified, reported, and mitigated.	No
	26	Completion	Initial versions of corporate "as-is" and "to-be" EA and sequencing plan are being developed. **ODT Note:** The CFTC has a large cache of "to-be" documents, including data models, network and database diagrams and several as-is artifacts including database diagrams and data models. **OIG Evaluation**: An EA program would organize the above artifacts, if relevant to meeting an approved mission goal.	No
	27	Completion	Initial version of corporate EA describing the enterprise in terms of performance, business, data, services, technology, and security is being developed.	No
	28	Completion	One or more segment and/or federation member architectures are being developed. **ODT Note:** CFTC is too small to develop segment architectures. All mission areas are very intertwined in terms of business process and data. **OIG Evaluation**: An EA program with CPIC would allow mission areas to drive requirements suitable to their needs.	No
	29	Completion	Architecture products are being developed according to the EA content framework.	No
	30	Completion	Architecture products are being developed according to a defined EA methodology.	No
	31	Completion	Architecture products are being developed using EA tools. **ODT Note:** CFTC has not designated any tools specifically as EA tools given that appropriate management oversight is exercised to ensure that the right tools are used for the right job. **OIG Evaluation**: No comment.	No
	32	Results	Architecture development progress is measured and reported.	No
4			**Completing and Using an Initial EA Version for Targeted Results**	
	33	Use	Executive committee has approved the initial version of corporate EA.	No
	34	Use	Key stakeholders have approved the current version of subordinate architectures.	No
	35	Use	EA is integral to the execution of other institutional management disciplines.	No

GAO Maturity Stage	GAO Core Element	OMB Capability Area[26]	Description	Assessment Satisfied? (Yes/No)[27]
	36	Use	Program office human capital needs are met.	No
	37	Completion	Initial versions of corporate "as-is" (current state) and "to-be" (future state) EA and sequencing plan exist.	No
	38	Completion	Initial version of corporate EA captures performance, business, data, services, technology, and security views.	No
	39	Completion	One or more segment and/or federation member architectures exist and are being implemented.	No
	40	Results	EA product quality is measured and reported.	No
	41	Results	EA results and outcomes are measured and reported.	No
	42	Results	Investment compliance with corporate and subordinate architectures is measured and reported.	No
	43	Results	Subordinate architecture alignment with the corporate EA is measured and reported.	No
5	**Expanding and Evolving the EA and Its Use for Institutional Transformation**			
	44	Use	Organization head has approved current version of the corporate EA.	No
	45	Use	Organization component heads or segment owners have approved current version of their respective subordinate architectures.	No
	46	Use	Integrated repository tools and common EA framework and methodology are used across the enterprise.	No
	47	Use	Corporate and subordinate architecture program offices operate as a single virtual office that shares resources enterprise wide.	No
	48	Completion	Corporate EA and sequencing plan are enterprise wide in scope.	No
	49	Completion	Corporate EA and sequencing plan are aligned with subordinate architectures.	No
	50	Completion	All segment and/or federated architectures exist and are horizontally and vertically integrated	No
	51	Completion	Corporate and subordinate architectures are extended to align with external partner architectures.	No
	52	Results	EA products and management processes are subject to independent assessment.	No
6	**Continuously Improving the EA and Its Use to Achieve Corporate Optimization**			
	53	Use	EA is used by executive leadership to inform organization strategic planning and policy formulation.	No
	54	Use	EA human capital capabilities are continuously improved.	No
	55	Use	EA methodologies and tools are continuously improved.	No
	56	Use	EA management processes are continuously improved and reflect the results of external assessments.	No

GAO Maturity Stage	GAO Core Element	OMB Capability Area[26]	Description	Assessment Satisfied? (Yes/No)[27]
	57	Completion	EA products are continuously improved and updated.	No
	58	Results	EA quality and results measurement methods are continuously improved.	No
	59	Results	EA continuous improvement efforts reflect the results of external assessments.	No

EA PROGRAMS NEED TO CONSIDER SECURITY REQUIREMENTS

The National Institute Standards and Technology (NIST) *Special Publication (SP) 800-53A Revision 4, Project Management Control Family* (PM-7 Enterprise Architecture)[28] requires agencies to integrate IT security into their capital planning and EA processes. Furthermore, GAO[29] and OMB[30] recognize security as one of the core elements that measures the effectiveness of EA and IT investment programs. However, management does not have a methodology for estimating, tracking, and reporting return on IT security investments to determine which IT security controls to fund. The lack of IT investment policies and practices, including an agency-wide methodology for security funding estimations, makes it more challenging to support resources for its mission and business needs.

[28] NIST, Security and Privacy Controls for Federal Information Systems and Organizations, SP 800-53 (Rev. 4), PM-7 Enterprise Architecture (Gaithersburg, Md., Dec. 2014).
[29] OMB Circular A-11, Preparation, Submission and Execution of the Budget.
[30] OMB Circular A-11, Preparation, Submission and Execution of the Budget; OMB Circular A-130, Management of Federal Information Resources.

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APPENDIX B

POLICIES AND PROCEDURES ARE LACKING

As illustrated in Table 1, CFTC does not have formal policies and procedures for an EA program, and consequently will not be able to create and measure the status and progress of an EA. OMB and GAO have noted that, as with any investment, EA should produce benefits, or returns on investment that can be measured against costs.[31] OMB's guidance states that each executive agency should measure its EA activities against quality standards—metrics defined in an EA development and maintenance methodology that assess an EA program's ability to assist management's decisions on IT changes and investments.[32]

OMB further states that, in order for management to benefit from EA, each agency should regularly report EA quality measurements to appropriate agency officials.[33] However, CFTC does not have an agency-wide program for EA activity monitoring, and does not require components to report EA performance measures, plans for improvement of EA programs, or EA's cost savings. Also, management has not formalized capital planning[34] policies and procedures that expand vision setting and investment decision making to mission operations. In January 2017 hired a program analyst with enterprise architecture experience, but to date there is no EA program in place.

Federal agencies such as the U.S. Environmental Protection Agency and the U.S. Social Security Administration have made transparent their policy and procedures for IT investment controls.[35] They segregate investment by size and portfolios. Also smaller agencies such as the U.S. Federal Election Commission recognizes that when it makes capital investment, especially on Information Technology investments, a net return on investment is expected.

We do recognize that internally ODT performs the following activities:

- Project Investment Reviews – Prior to investing in any new IT initiative or prior to expanding an existing IT initiative, an investment review is performed by the IT Leadership Team, which includes the CIO and

[31] Common Approach to Federal Enterprise Architecture, page 3, n.1 (and accompanying text) (May 2012).
[32] OMB Circular A-11, Preparation, Submission and Execution of the Budget.
[33] OMB Circular A-11, Preparation, Submission and Execution of the Budget.
[34] OMB A-11 Section 31.8, *Management Improvement Initiatives and Policies, Capital Planning and Investment Control.*
[35] Environmental Protection Agency, *Information Policy* (Dec. 2015)(EPA CPIC), Social Security Administration, *Capital Planning and Investment Control* (Jan. 2016)(SSA CPIC), Federal Election Commission, *Performance and Accountability Report* (FY2006)(FEC PAR).

branch chiefs that cover Enterprise Infrastructure, Enterprise Applications, Enterprise Data Management and Enterprise Security.

- Project Management Lifecycle – IT investments are required to operate under the Project Management Lifecycle, which requires:

    - Enterprise alignment and conformance with standards;
    - Alignment and conformance with federal security standards;
    - Inter-divisional coordination around data standards; and
    - Supporting Commission-wide priorities for data.

While useful, these ODT efforts do not satisfy the requirements of the CCA. The required “as is” (current state) architecture and the "to be” (future state) architecture, with related policies and procedures, all approved at appropriate levels, do not exist. Even though we regard as positive the fact that ODT IT leadership team performs a review prior to investing in any new IT initiative or prior to expanding an existing IT initiative, under a CCA-compliant EA these decisions should be made at higher (mission) levels. The current process does not provide an outline of roles and responsibilities for CFTC leadership, and does not cover all of the elements specified by OMB.

The lack of an agency-wide performance measurement program and accountability inhibits CFTC’s ability to achieve or document cost savings or to measure the direct benefits of EA value to stakeholders. Consequently, management cannot track architecture development and use; or evaluate the benefits versus costs of various IT investment decisions, that is, monitor the impact and resulting savings of EA products and services on IT and business investment decisions, collaboration, and reuse.

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APPENDIX C

IT INVESTMENT EARMARKS SPENT ON OPERATIONS

Since 2011, Congress has annually earmarked between $35 and $50 million in the CFTC's appropriated budget for information technology, most recently using this statement: "…of which not less than $50,000,000 … shall be for the purchase of information technology."[36] The exact appropriations language has varied by year, but legislative history has consistently described the earmarks as being for "investments in technology."[37] The Government Accountability Office defines the relevant terms Information Technology (IT) and IT Investment used by Congress as follows:

- Information Technology: The computers, ancillary equipment, software, firmware, and related procedures, services (including support services), and other resources that are used by an organization to accomplish a function.[38]

- IT Investment: The expenditure of resources on selected information technology or IT-related initiatives with the expectation that the benefits from the expenditure will exceed the value of the resources expended.[39]

As presented in Table 2 below, our analysis of cost categories for CFTC's FY 2017 earmark shows that 61% or $30,390,896 of $50,000,000 [40] are questionable as these costs were for routine information technology needs rather than IT investment.

Table 2: *CFTC FY 2017 Earmark ($50 Million) By Cost Category*

Cost Category	Acquisition Type	Acquisition Sub-Type	Information Technology $	IT Investment $
Workforce and	Mission System	Law Offices Services (eLaw) (MSS1)	4,090,090	
		Computer Forensics (MSS2)	839,204	
		Market and Financial Oversight	1,844,910	

[36] P.L. 115-31 (2017). Congress has also in the past authorized the transfer of funds from the IT earmark to pay CFTC salaries and benefits. See, P.L. 112-74, § 744, 125 STAT. 939 (Dec. 23, 2011); see also, GAO, B-325351, *Commodity Futures Trading Commission – Fiscal Year 2013 Transfer Authority* (April 25, 2014).
[37] See discussion of appropriations language and legislative history, Appendix E.
[38] Government Accountability Office (GAO) – Information Technology Investment Management, A Framework for Assessing and Improving Process Maturity (GAO-04-394G), page 115.
[39] Government Accountability Office (GAO) – Information Technology Investment Management, A Framework for Assessing and Improving Process Maturity (GAO-04-394G), page 116.
[40] As of September 29, 2017, $49,907,239 of $50,000,000 was obligated. Source: CFTC Daily Status of Funds report.

Cost Category	Acquisition Type	Acquisition Sub-Type	Information Technology $	IT Investment $
		Data Harmonization and Quality (MSS4)	3,270,000	3,270,000
		Data Ingest and Analysis (MSS5)	5,912,700	5,912,700
		CFTC Portal/ Cloud Hosting (MSS6)	1,775,000	
		Statistical Analysis Software	1,220,735	
		System Operations and Maintenance (MSS8)	3,336,168	
	Audio Visual (AV)	Cable TV Subscriptions for	56,651	
		Conference Room Software and Maintenance (AV2)	286,443	
		Live Internet Broadcasting for	270,000	
	Mobile Communications (MC)	Mobile Wireless Services (MC1)	744,850	
		Mobile Equipment/Maintenance (MC2)	-	
		Mobile Software and Maintenance	58,390	
Agency Management and Compliance	Agency Management and Compliance (AMC)	Financial Management (AMC1)	419,438	
		Human Resources (AMC2)	686,561	
		Training (AMC3)	227,810	
		CFTC.gov Website (AMC4)	2,010,611	
		Records Management/Documentation Support (AMC5)	1,500,126	
		Logistics Services (AMC6)	504,754	
Core System Operations	Business Continuity (BC)	Emergency Communications Operations and Maintenance (BC1)	388,500	388,500
		Business Continuity	1,752,620	1,752,620
	Information Technology Security (ITS)	Cybersecurity Program Management and Operations (ITS1)	3,671,023	3,671,023
		Cybersecurity Equipment and	612,479	612,023
		Cybersecurity Software and Maintenance Services (ITS3)	321,051	321,051
	Enterprise	Enterprise Network Software and	2,495,890	

Cost Category	Acquisition Type	Acquisition Sub-Type	Information Technology $	IT Investment $
	(NOM)	Enterprise Network Hardware and Maintenance Services (NOM2)	3,014,479	
		IT Help Desk Operations and Maintenance (NOM3)	2,810,928	
		Enterprise network Multi-Function Printers (NOM4)	127,500	
	Tele-Communications (TC)	TC Operations and Maintenance Services (TC1)	1,721,730	
		Equipment Tech/Refresh (TC2)	60,000	
		Software and Hardware Maintenance/License Renewals (TC3)	288,171	
	Technology Refresh (TR)	Core System Technology Refresh (TR1)	3,681,187	3,681,187
Total			$50,000,000 (A)	$19,609,104 (B)
Amount Related to Routine IT Operations			**(A)-(B)**	**$ 30,390,896 61%**

This means CFTC spent only $19,609,104 for IT investments with the majority of the IT earmark spent on day to day IT operations. In evaluating CFTC's compliance with the FY2017 appropriations language, our legal analysis[41] concluded that it is very unlikely that CFTC has violated the Anti Deficiency Act as the appropriations language for the earmark states it "shall be for the purchase of information technology." That language is very broad, and should encompass all spending related to information technology use. The fact that reports from Committees of Congress indicate some intent to limit the IT earmark to "mission-critical investments in technology," does not mean the full Congress shared that intent, especially given the appropriations language. If Congress determines that the IT earmark is not being spent appropriately, it may wish to alter the appropriations language to assure it is spent appropriately in the future.

[41] APPENDIX E presents our legal analysis in its entirety.

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APPENDIX D

OBJECTIVE, SCOPE AND METHODOLOGY

Our audit objective(s) were to assess and evaluate EA program practices. We assessed and evaluated EA program practices in detail to determine whether CFTC: (1) established an adequate baseline and a target enterprise architecture; (2) implemented effective management practices, policies, and processes for the development, implementation, maintenance, and oversight of the EA program; and, given annual Congressional IT earmarks, (3) reported IT investment results from this program.

To answer our objectives we relied on CFTC documentation, as well as interviews with CFTC personnel, in formulating our assessments with respect to the CFTC's progress towards obtaining stakeholder support of the current state "as is," the establishment of an EA program plan to ensure adequate compliance with EA policies and procedures, and the development of a complete future state "to be" architecture with parallel mappings to the requirements of the GAO EA Maturity reference model.

In our evaluation of current and target EA development, and quality of the EA program, we used OMB and GAO guidance, and NIST Special Publication series. For instance, we used as a benchmark GAO's *Framework for Assessing and Improving Enterprise Architecture Management*[42] to determine if CFTC satisfied all 59 core elements for the development, maintenance, and use of an EA. We also used OMB's EA Framework, which consists of three capability areas: 1) completion, 2) use, and 3) results. OMB's capability area representations of the critical success attributes are fundamentally aligned and substantially consistent to GAO's core elements.

This performance audit was conducted at CFTC Headquarters in Washington, D.C., in accordance with *Generally Accepted Government Auditing Standards*.[43] Those standards require that 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 that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[42] Government Accountability Office (GAO) Generally Accepted Government Auditing Standards (GAGAS) Revision 2011.
[43] Refer to Appendix H for ODT structure.

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APPENDIX E

OIG LEGAL ANALYSIS OF CFTC IT EARMARKS

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To: Office of Audits

From: Judith A. Ringle,
Deputy Inspector General and Chief Counsel

Date: September 13, 2017

RE: CFTC Information Technology Earmark Appropriations Language and Legislative History

Summary

The Antideficiency Act (ADA) prohibits federal employees from making or authorizing an expenditure from, or creating or authorizing an obligation under, any appropriation or fund in excess of the amount available in the appropriation or fund unless authorized by law. The ADA also prohibits federal employees from obligating the government before funds have been appropriated for that purpose, unless otherwise allowed by law.

Since Fiscal Year (FY) 2011, Congress has designated amounts to be spent by the CFTC on Information Technology (the IT earmark). In FY2011 the appropriations language for the IT earmark stated that the earmark was for "the highest priority information technology activities." In FY2012 and FY2013 Congress appropriated the IT earmark for "information technology investments." Most recently (FY2014 through FY2017) the appropriations language has stated the earmark "shall be for the purchase of information technology."

The phrase "shall be for the purchase of information technology" is not ambiguous. Therefore, so long as an expenditure from the IT earmark has some relation to information technology, I recommend that OIG not conclude that CFTC misspent the IT earmark for FY2014 through FY2017. Reliance on legislative history is unnecessary to assist evaluation of CFTC's compliance with the appropriations language (and the ADA).

Nevertheless, legislative history may be useful to motivate and inform this audit. It appears at least part of Congress intended that the IT earmark be spent on IT investments. Furthermore, there is no indication that Congress specifically intended the IT earmark to be spent on routine overhead IT costs. It makes imminent sense to evaluate how the IT earmark is being spent with this history in mind. If Congress determines the IT earmark is not being spent appropriately, your work may lead to more specific appropriations language for the IT earmark in the future.

Discussion

The Anti-Deficiency Act

The Antideficiency Act[1] prohibits federal employees from

- making or authorizing an expenditure from, or creating or authorizing an obligation under, any appropriation or fund in excess of the amount available in the appropriation or fund unless authorized by law.[2]
- involving the government in any obligation to pay money before funds have been appropriated for that purpose, unless otherwise allowed by law.[3]
- accepting voluntary services for the United States, or employing personal services not authorized by law, except in cases of emergency involving the safety of human life or the protection of property.[4]
- making obligations or expenditures in excess of an apportionment or reapportionment, or in excess of the amount permitted by agency regulations.[5]

Federal employees who violate the Antideficiency Act are subject to appropriate administrative discipline including, when circumstances warrant, suspension from duty without pay or removal from office.[6] In addition, employees may also be subject to fines, imprisonment, or both.[7]

Appropriations Language for the CFTC IT Earmark

FY 2011[8]	….not less than $ 37,200,000 shall be **for the highest priority information technology activities** of the Commission.
FY 2012[9]	….of which $55,000,000 shall remain available **for information technology investments** until September 30, 2014.
FY 2013[10]	… the level for the "Commodity Futures Trading Commission" shall be the level specified under Public Law 112-55 and the authorities and conditions, including comparable periods of availability, provided under such Public Law shall apply to such appropriation.
FY 2014[11]	… of which $ 35,000,000, shall be **for the purchase of information technology** until September 30, 2015.
FY 2015,[12] 2016,[13] 2017[14]	…of which not less than $50,000,000, to remain available until September 30, 2015 [2016, 2017], **shall be for the purchase of information technology.**

[1] P.L. 97-258, 96 STAT. 916 (1982).
[2] 31 U.S.C. § 1341(a)(1)(A).
[3] 31 U.S.C. § 1341(a)(1)(B).
[4] 31 U.S.C. § 1342.
[5] 31 U.S.C. § 1517(a).
[6] 31 U.S.C. § 1349.
[7] 31 U.S.C. § 1350.
[8] P.L. 112-10, 125 STAT. 3181 (2011).
[9] P.L. 112-55, 125 STAT. 579 (2011).
[10] P.L. 113-6, 127 STAT. 418 (2013).
[11] P.L. 113-76, 128 STAT. 32 (2014).
[12] P.L. 113-235, 128 STAT. 2357 (2014).
[13] P.L. 114-113, 129 STAT. 2271 (2015).
[14] P.L. 115-31 (2017).

Legislative History

Legislative history indicates Congress intended the IT earmark for "mission-critical investments in technology" directly related to implementation of the Commodity Exchange Act, with no indication that Congress intended it to be used for routine IT overhead.

Legislative history for the IT earmark follows:

FY 2011: The Committee further emphasizes the need for CFTC to make mission-critical investments in technology to sort through the millions of pieces of information generated daily by markets, much of it electronic. Proper oversight of markets requires transparency. The backbone of the CFTC's market surveillance program is the large trader reporting system. The amount and detail of trade data collected and analyzed at the CFTC is unprecedented among regulatory financial agencies.[15]

FY 2012: The Committee underscores the crucial need for the CFTC to make mission-critical investments in technology to sort through the millions of pieces of information generated daily by markets. The CFTC's responsibilities to integrate both swap and futures markets and perform required analysis and oversight requires a complete overhaul of the current systems and a greater attention to automating surveillance and market risk analysis. The amount and detail of trade data collected and analyzed at the CFTC is expanding with its new authority over swaps markets and can only be managed by completely automating the collection and analysis of market data.[16]

FY 2013 To address this massive growth surge in workload expected with respect to previously unregulated swaps entities, while still maintaining strong vigilance over its core responsibilities that predated the statutory duties of Dodd-Frank, it is imperative that the staffing and organization of the CFTC adapt to keep pace. That cannot be undertaken without a significant increase in its operating budget that balances investments in human capital and technology.

Promptly collecting, synthesizing, managing, and analyzing the vast volume of data and information is paramount in CFTC's surveillance work and real-time public reporting. Without question, enhanced cutting-edge technology is essential to CFTC's capacity to leverage financial and human resources to execute not only the CFTC's core mission, but for fulfilling the expanded responsibilities under Dodd-Frank reforms.

[15] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, Sen. Rpt. 111-238, p.81, 111th Cong. (July 29, 2010).
[16] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, Sen. Rpt. 112-79, pg. 70, 112th Cong., 1st Sess. (Sept. 15, 2011).

The Committee underscores the crucial need for the CFTC to make mission-critical investments in technology to sort through the millions of pieces of information generated daily by markets. The CFTC's responsibilities to integrate both swaps and futures markets and perform required analysis and oversight requires a comprehensive overhaul of the current systems and a greater attention to automating surveillance and market risk analysis. The amount and detail of trade data collected and analyzed by the CFTC is expanding with its new authority over swaps markets and can only be managed by completely automating the collection and analysis of market data.[17]

FY 2014 The funding level will … allow mission-critical investments in new and upgraded sophisticated technology to collect, monitor, and analyze voluminous quantities of data generated round-the-clock by global trading markets. For example, the CFTC needs to continue to enhance and incorporate software to load swaps data into a data warehouse computer for use in market surveillance, risk monitoring, enforcement, and economic analysis.

The Committee is particularly concerned that without the requested resources, the CFTC will continue to face extreme challenges in accomplishing all that it is expected to do, and at a significant technological disadvantage. It is imperative that the staffing and organization of the CFTC adapt to keep pace with the growth surge which cannot be undertaken without an increase in its operating budget that balances investments in human capital and technology.

****

Without question, enhanced cutting-edge technology is essential to CFTC's capacity to leverage financial and human resources to execute not only the CFTC's core mission, but for fulfilling the expanded responsibilities under Dodd-Frank reforms.

Information Technology Investments.—The Committee underscores the crucial need for the CFTC to make mission-critical investments in technology to sort through the millions of pieces of information generated daily by markets. The CFTC's responsibilities to integrate both swaps and futures markets and perform required analysis and oversight requires a comprehensive overhaul of the current systems and a greater attention to automating surveillance and market risk analysis. The amount and detail of trade data collected and analyzed by the CFTC is expanding with its new authority over swaps markets and can only be managed by completely automating the collection and analysis of market data.[18]

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[17] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, Sen. Rpt. 112-177, pg 70-71, 112th Cong., 2d Sess. (June 14, 2012).
[18] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, Sen. Rpt. 113-80, page 74-75, 113th Cong., 1st Sess. (July 25, 2013).

Five-year Strategic Information Technology Plan.—The Committee directs CFTC to develop a five-year, strategic technology investment plan. This plan may be produced individually or incorporated as an appendix to the Commission's five-year strategic plan. The plan should include achievable objectives with measurable results supported by projected resource requirements. The focus should be on market surveillance, risk management, and customer protection by transitioning from personnel to technology in today's electronic marketplace.[19]

FY 2015 The agreement provides $250,000,000 for the Commodity Futures Trading Commission. This total includes not less than $50,000,000, to remain available until September 30, 2016, for information technology investments; not less than $2,620,000 for the Office of the Inspector General; and not to exceed $10,000,000 for transfers between the amounts for salaries and expenses and information technology. The agreement directs the Commission to consult with the Committees in developing its five-year strategic plan as required by Public Law 111–352. The agreement further directs the Commission to develop a comprehensive, multi-year technology plan as a separate appendix with defined goals for overseeing electronic trading environments. The agreement directs the Commission to submit, within 30 days of enactment, a detailed spending plan for the allocation of the funds made available, displayed by discrete program, project, and activity, including staffing projections, specifying both FTEs and contractors, and planned investments in information technology.[20]

Five-year Strategic Information Technology Plan – The Committee notes that the Commission did not submit a five-year, strategic technology investment plan per the directive in H. Rpt. 113–166. The Committee directs the Commission to develop the plan. It is essential that the Committee know where and how these investments are to be made with the funding provided in this bill per the President's request for information technology.[21]

FY 2016 The Committee recommendation includes $51,000,000 for the purchase of information technology. The Committee highlights the crucial need for the CFTC to make mission-critical investments in technology to sort through the vast volume of data and information generated daily by markets. The CFTC's responsibilities to conduct effective oversight and analysis of the swaps and

[19] House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies, H. Rept. 113-116, page 59, 113th Cong., 1st Sess. (June 18, 2013).
[20] Committee notes, Division E, p. 33(Dec. 8, 2014).
[21] House Committee on Appropriations, Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies, H. Rept. 113-468, page 65, 113th Cong., 2d Sess. (June 4, 2014).

futures markets requires greater attention to and investments in its information technology systems.[22]

FY 2017 The Committee recommendation includes $50,000,000 for the purchase of information technology. The Committee highlights the crucial need for the CFTC to make mission-critical investments in technology to sort through the vast volume of data and information generated daily by markets. The CFTC's responsibilities to conduct effective oversight and analysis of the swaps and futures markets requires greater attention to and investments in its information technology systems.[23]

Spending the IT earmark on day-to-day IT expenses should not violate the ADA

Spending the IT earmark in violation of the appropriations language could violate the ADA; however, based on the appropriations language approved by Congress, it is very unlikely that CFTC has violated the ADA recently. The appropriations language for FY2014 through FY2017 is uniform: "**shall be for the purchase of information technology**." That language is very broad, and should encompass all spending related to information technology use. Although one might wish to limit the interpretation of such broad language based on legislative history, to do so could violate a basic rule of statutory construction, known as the plain meaning rule:

> It is elementary that the meaning of a statute must, in the first instance, be sought in the language in which the act is framed, and if that is plain, and if the law is within the constitutional authority of the law-making body which passed it, the sole function of the courts is to enforce it according to its terms.[24]

Legislative history for the IT earmark indicates that, for FY 2011 through FY 2017, more was intended (i.e., "mission-critical investments in technology") than was actually required through appropriation ("purchase of information technology"). In fact, nowhere in the legislative history does Congress state that routine IT overhead expenditures are permitted or even anticipated. In this situation, a relevant (and more recent) explanation of the plain meaning rule assists:

> The meaning of terms on the statute books ought to be determined, not on the basis of which meaning can be shown to have been understood by a larger handful of the Members of Congress; but rather on the basis of which meaning is (1) most in accord with context and ordinary usage, and thus most likely to have been understood by the whole Congress which voted on the words of the statute (not to mention the citizens subject to it), and (2) most compatible with the surrounding body of law into which the

[22] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, S. Rpt. 114-97, page 74-75, 114th Cong, 1st Sess. (July 30, 2015).
[23] U.S. Senate Committee on Appropriations, Subcommittee on Financial Services and General Government, S. Rpt. 114-280, page 74-75, 114th Cong. 2d Sess (June 16, 2016).
[24] *Caminetti v. United States*, 242 U.S. 470, 485 (1917).

> provision must be integrated -- a compatibility which, by a benign fiction, we assume Congress always has in mind.[25]

So, the fact that reports from Committees of Congress indicate an intent to limit the IT earmark to "mission-critical investments in technology," does not mean the full Congress shared that intent, especially given the appropriations language. If Congress determines that the IT earmark is not being spent appropriately, it may wish to alter the appropriations language to assure it is spent appropriately in the future.

[25] *Green v. Bock Laundry Mach. Co.*, 490 U.S. 504, 528 (1989) (J. Scalia, concurring).

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APPENDIX F

ENTERPRISE ARCHITECTURE REFERENCES

We determined the following laws and regulations relevant and applicable to federal enterprise architecture audit.

- The Clinger-Cohen Act, (a.k.a. the Information Technology Management Reform Act of 1996), P.L. 104-106, Division E, 110 STAT. 679 (1996).

- E-Government Act of 2002, (a.k.a. e-Government Act), H.R. 2458, P.L. 107-347, 116 STAT. 2899 (2002).

- The Government Performance and Results Modernization Act of 2010, (a.k.a. GPRA Modernization Act of 2010), H.R. 2142, P.L. 111-352, 124 STAT. 3866 (2011).

- Federal Information Technology Acquisition Reform Act, (a.k.a. FITARA), H.R. 1232, Became part of the National Defense Authorization Act for Fiscal Year 2015, Title VIII, Subtitle D, H.R. 3979, P.L. 113-291, 128 STAT. 3438 (2014).

- Federal Information Security Modernization Act of 2014, (a.k.a. FISMA), S. 2521, P.L. 113-283, 128 STAT. 3073 (2014).

- NIST, Security and Privacy Controls for Federal Information Systems and Organizations, SP 800-53 (Rev. 4), PM-7 Enterprise Architecture (Gaithersburg, Md., Dec. 2014).

- OMB Circular A-11, Preparation, Submission and Execution of the Budget.

- OMB Circular A-130, Management of Federal Information Resources.

- Federal Enterprise Architecture Framework, Version 2, Office of Management and Budget (Jan. 2013).

- Federal Transition Framework, Office of Management and Budget webpage.

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APPENDIX G

MANAGEMENT COMMENTS

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Office of Data & Technology
OIG EA Audit Management Response

MEMORANDUM

TO: A. Roy Lavik, Inspector General

FROM: John L. Rogers, Chief Information Officer

DATE: December 15, 2017

SUBJECT: Commodity Futures Trading Commission Management Response to the Audit of CFTC's Enterprise Architecture Program

We appreciate the opportunity to respond to the subject draft report. As noted by the 2017 CFTC Inspector General's (IG) audit of the enterprise architecture (EA) program, the Commodity Futures Trading Commission (Commission) has taken many positive actions, and remains committed to achieving the goals of an EA program. The audit concluded that CFTC is practicing basic standards of governance and should leverage these successes to further improve and formalize the EA program. We understand the IG's references from the EA audit report and appreciate the recommendations made.

Enclosed please find the Office of Data Technology (ODT) comments in response to the recommendations. If you require further assistance, please contact Naeem Musa, Deputy Director of Policy and Planning / Chief Information Security Officer at (202) 418-5485.

Sincerely,

John L. Rogers

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Office of Data & Technology
OIG EA Audit Management Response

Management Response

In principal, we concur with the general findings and recommendations of the CFTC Office of the Inspector General (OIG) Audit of CFTC's formal Enterprise Architecture Program.

CFTC management recognizes the value of Enterprise Architecture (EA) as enacted in the Clinger-Cohen Act and the E-government Act of 2002. Management concurs with the OIG's finding that the Office of Data and Technology (ODT) does not have a formal EA program; however, ODT successfully has implemented key EA functions and governance to ensure alignment of Information Technology (IT) investments with mission objectives. Thus, these efforts have enabled the Commission to function in compliance with the spirit of the Clinger-Cohen Act and consistent with the goals of a formal EA program which consist of the following: integrating strategic drivers, business requirements and technology solutions.

Existing Efforts

In January 2015, the Commission approved the IT Strategic Plan (ITSP) which was developed by ODT and representatives from the operating divisions. The ITSP includes specific alignment between IT strategic initiatives and CFTC goals and objectives articulated in the CFTC strategic plan to ensure that the limited IT resources are spent on systems that best support the agency's mission and strategic goals. In addition to the ITSP, ODT follows a process to review all IT investments with the divisions to ensure these investments continue to be relevant, appropriate, and efficient. These "IT Portfolio Reviews" are conducted regularly with each Division Director and their staff. Initiations of new investments and requirements for new projects require sign-off by Division Directors to ensure the proposed solution or service meet the goals and objectives of the divisions in support of the agency's mission and strategic goals.

CFTC IT is centralized under one Chief Information Officer (CIO) which is different than at some of the larger agencies that have more formal EA programs. The value of centralized IT for CFTC ensures the central management of the IT budget to maintain that all corresponding investments are strongly aligned with an EA strategy. Further, it helps reduce the cost and complexity of maintaining new IT investments by ensuring strong interoperability of the Commission's enterprise systems.

The Dodd–Frank Wall Street Reform and Consumer Protection Act (2010) required CFTC to quickly envision and implement an IT target state to accommodate an astronomical increase in the amount of data required to execute mission functions. ODT has worked in close collaboration with the mission divisions to ensure the timely evolution of IT investments to keep up with the futures industry which was rapidly transitioning from physical, localized trading

venues with moderate trading volumes to electronic, global, inter-connected venues with significantly higher trading volume, products, product complexity, number of participants, and data volume[1].

Formal EA programs are resource intensive and difficult to fully implement at small agencies; therefore, ODT implemented core areas of EA that provide the most direct and tangible value to IT investments. In 2011, CFTC hired a Chief Data Officer to lead a newly formed Data Management Branch to focus on the "data layer" of the CFTC enterprise. This marked one of the earliest Chief Data Officer hires in the Federal Government. The Data Management Branch's key area of focus is data governance. The Branch established two enterprise-wide governance bodies focused on data governance: the Data Steering Committee, which includes membership of Division Directors, to support Commission-wide priorities for data; and, the Data Officers' Technical Working Group (DOTWG) to provide inter-divisional coordination. In addition, the Data Management Branch has spearheaded the formation of an enterprise Data Catalog, designed to increase transparency to data assets available across the CFTC, and to streamline the provisioning of access. These initiatives have achieved the OMB mandate that an overall EA program also should support all program offices in meeting strategic objectives by enhancing flexibility and interoperability across information systems, reducing redundancies, and improving access to accurate, timely, and consistent information.

CFTC has made mission-critical investments in technology. All technology investments require an upfront implementation phase as well as an ongoing operations and maintenance phase. Dodd-Frank required the collection of massive amounts of data, which necessitated the implementation of a mechanism to collect the data, as well as the ability to store and perform analytics on the data. As is typical with IT investments, sustainment costs continue beyond the initial investment. CFTC has sought, and will continue to seek, opportunities to streamline IT investments to reduce the cost of sustaining systems and infrastructure over time.
Each of the investments requires the implementation or operations of multiple IT projects. In order to effectively manage a wide range of IT projects, CFTC has an established Project Management Life Cycle for projects that requires consistent execution through project initiation, planning, requirements, design and development, implementation, operations and maintenance, and retirement phases.

CFTC ODT has implemented strong governance around the configuration and change management of IT investments to ensure that all information systems are developed, managed, and maintained using standard configurations for interoperability, functionality, security, requirements traceability, and disaster recovery. This helps provide assurance that CFTC operates a cohesive enterprise, and that all changes to the enterprise are properly vetted to ensure proper investment decisions that support mission operations. Each change introduced also requires the completion of a Security Impact Assessment (SIA). This ensures that the information security risk is continuously managed across the CFTC enterprise.

[1] President's Budget and Performance Plan FY2012, Commodity Futures Trading Commission, February 2011

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As discussed earlier, management agrees that the agency lacks a formal EA program; however, the steps described above demonstrate that many of the goals of an EA program are still being met. Management agrees that a formal program will further enhance the work ODT is doing to support the goals of an EA program and, as described below, has enacted one OIG recommendation and made plans for the remaining recommendations.

Current and Future Efforts in Progress

ODT remains committed to achieving the goals of an EA program and instituting changes required for a formal EA program to the extent possible within resource constraints. To achieve this, consistent with the OIG's recommendation, CFTC recently established an IT Investment Review Board (ITIRB), comprised of Division Directors and leadership from supporting offices, including the Executive Director, General Counsel, Chief Information Officer, Chief Financial Officer, Chief Information Security Officer, Budget Officer, and senior leaders. The ITIRB was established to provide executive decision-making on, and oversight of, CFTC IT investment planning and management and to ensure compliance with the statutory and regulatory direction from Congress, the Office of Management and Budget (OMB) and other applicable Federal oversight entities. The ITIRB will prioritize and approve IT investments, which is a core part of a formal EA program. The first ITIRB meeting is planned for January 2018.

ODT plans to submit an unfunded request for staffing an Enterprise Architect who, if funded, will lead the formal documentation of the future state roadmap that aligns with mission operations. This will address the OIG recommendation to formalize EA leadership with responsibilities for a future state roadmap that aligns with mission operations.

ODT is actively developing the FY19-FY23 IT Strategic Plan, and part of our plan includes the definition of performance measures necessary to achieve strategic objectives. Once these performance measures are established, ODT plans to conduct regular reviews to ensure that IT investments are demonstrating measurable benefit in alignment with agency objectives. This will address the OIG recommendation to establish IT performance measures to monitor investment status.

Conclusion

CFTC management would like to thank the Inspector General for reviewing Enterprise Architecture practices within CFTC. As previously stated, management concurs that the agency lacks a formal EA program; however, many of the goals of an EA program are still being met.

ODT remains committed to achieving the goals of an EA program and instituting changes required for a formal EA program to the extent possible within resource constraints. Management agrees that a formal program will further enhance the work ODT is doing to support the goals of an EA program and, as described above, has enacted one OIG recommendation and made plans for the remaining recommendations.

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APPENDIX H