Implementation of the Digital Accountability and Transparency Act of 2014

REPORT PREPARED BY KEARNEY & COMPANY

NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL

November 17, 2017
OIG 18-2-001

NSF

AT A GLANCE

Implementation of the Digital Accountability and Transparency Act of 2014

Report No. OIG 18-2-001
November 17, 2017

AUDIT OBJECTIVE

The National Science Foundation Office of Inspector General engaged Kearney & Company (Kearney) to conduct a performance audit of the National Science Foundation's second quarter fiscal year 2017 spending data submitted under the *Digital Accountability and Transparency Act of 2014* (DATA Act). The objectives of the audit were to assess the accuracy, completeness, timeliness, and quality of NSF's financial and payment data reported to the public through USASpending.gov and to assess NSF's implementation and use of the Government-wide financial data standards. Kearney is responsible for the attached auditor's report and the conclusions expressed in this report. NSF OIG does not express any opinion on the conclusions presented in Kearney's audit report.

AUDIT RESULTS

Kearney found that the spending data NSF submitted did not meet the quality requirements. Kearney identified inaccuracies in one or more data elements for 62.2 percent of transactions tested; specifically, 43.3 percent of transactions tested had errors due to NSF's reporting and 18.9 percent had errors due to Government-wide reporting issues. Kearney also identified that 98.8 percent of transactions omitted one or more of the required data elements; specifically, 41.7 percent were due to NSF's reporting and 57.1 percent were due to Government-wide reporting issues. Kearney also identified that 0.8 percent of transactions were untimely. Finally, Kearney noted that NSF had taken many steps to implement and use the Government-wide data standards; however, improvements are needed. As a result, if uncorrected, these errors increase the risk that inaccurate data will be uploaded to USASpending.gov, decreasing the reliability and usefulness of the data.

RECOMMENDATIONS

Kearney's report contains four recommendations aimed at improving the accuracy, completeness, timeliness, and quality of NSF's data reported through USASpending.gov.

AUDITEE RESPONSE

NSF disagreed with the percentage of the NSF-attributed errors and with calculating the error rate at the transaction level, rather than at the data element level. NSF generally agreed with all of the recommendations but stated that it has sufficient reconciliation and quality control procedures in its data submission processes. NSF's response is included in its entirety in Appendix E.

FOR FURTHER INFORMATION, CONTACT US AT (703) 292-7100 OR OIG@NSF.GOV.

MEMORANDUM

TO: Dr. France A. Córdova
Director
National Science Foundation

Ms. Teresa Grancorvitz
Acting Chief Financial Officer and Office Head
Office of Budget, Finance, and Award Management

FROM: Mark Bell
Assistant Inspector General
Office of Audits

DATE: November 17, 2017

SUBJECT: Audit Report No. 18-2-001, Implementation of the Digital Accountability and Transparency Act of 2014

This memo transmits Kearney & Company's (Kearney) audit report on the National Science Foundation's (NSF) implementation of the *Digital Accountability and Transparency Act of 2014* (DATA Act). The objectives of the audit were to assess the accuracy, completeness, timeliness, and quality of NSF's financial and payment data for the second quarter of fiscal year 2017 reported to the public through USASpending.gov and to assess NSF's implementation and use of the Government-wide financial data standards.

Kearney's report contains four recommendations aimed at improving the accuracy, completeness, timeliness, and quality of NSF's data reported through USASpending.gov. NSF generally agreed with the recommendations. Kearney has included NSF's response to its draft report as Appendix E.

OIG Oversight of Audit

To fulfill our monitoring responsibilities, we:

- reviewed Kearney's approach and planning of the audit;
- evaluated the qualifications and independence of Kearney and its staff;
- monitored the progress of the audit at key points;
- coordinated periodic meetings with Kearney and NSF management, as necessary, to discuss audit progress, findings, and recommendations;
- reviewed Kearney's audit report to ensure compliance with generally accepted government auditing standards; and
- coordinated issuance of the audit report.

Kearney is responsible for the attached auditor's report and the conclusions expressed in this report. We do not express any opinion on the conclusions presented in Kearney's audit report.

In accordance with Office of Management and Budget Circular A-50, *Audit Followup*, please provide a written corrective action plan to address the report recommendations. This corrective action plan should detail specific actions and associated milestone dates. Please provide the action plan within 60 calendar days of the date of this report.

We thank your staff for the assistance that was extended to Kearney and the OIG staff during this audit. If you have any questions regarding this report, please contact me at (703) 292-7100.

Attachment

cc:
John Anderson   Joanne Tornow
John Veysey   Dorothy Aronson
Ann Bushmiller   Avinash Tembulkar
Christina Sarris   Allison Lerner
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Michael Wetklow   Jannifer Jenkins

National Science Foundation
Office of Inspector General

Implementation of the Digital Accountability and Transparency Act of 2014 (DATA Act) Performance Audit
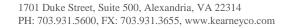
Performance Audit Report

November 17, 2017

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Dr. France A. Córdova
Director
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Ms. Teresa Grancorvitz
Acting Chief Financial Officer and Office Head, Office of Budget, Finance, and Award
Management and Senior Accountable Official (SAO)
National Science Foundation
2415 Eisenhower Avenue
Alexandria, VA 22314

RE: Audit of the National Science Foundation's Implementation of the Digital Accountability
        and Transparency Act of 2014

Dear Dr. Córdova and Ms. Grancorvitz:

Kearney & Company, P.C. (Kearney) has performed an audit of the National Science
Foundation's (NSF) implementation of the Digital Accountability and Transparency Act of 2014
(DATA Act). This performance audit, performed under Contract No. GS-00F-031DA, was
designed to meet the objective identified in the *OBJECTIVE* section of this report and further
defined in Appendix A: Purpose, Scope, and Methodology.

Kearney conducted this performance audit in accordance with *Government Auditing Standards*,
2011 Revision, issued by the Comptroller General of the United States. Those standards require
that Kearney plan and perform the audit to obtain sufficient, appropriate evidence to provide a
reasonable basis for the findings and conclusions based on the audit objectives. We believe that
the evidence obtained provides a reasonable basis for the findings and conclusions based on the
audit objectives.

Kearney appreciates the cooperation provided by NSF personnel during the audit.

Kearney & Company, P.C.
Alexandria, VA
November 17, 2017

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The National Science Foundation's (referred to as "NSF" in this document) Office of Inspector General (OIG) engaged Kearney & Company, P.C. (referred to as "Kearney," "we," and "our" in this document) to conduct a performance audit over NSF's second quarter (Q2) fiscal year (FY) 2017 spending data submitted under the Digital Accountability and Transparency Act of 2014[1] (DATA Act). The DATA Act requires Federal agencies to report financial and spending information to the public through USASpending.gov in accordance with Government-wide financial data standards developed and issued by the Office of Management and Budget (OMB) and the Department of the Treasury (Treasury). The Q2 FY 2017 spending data was the first data that Federal agencies were required to submit in accordance with these financial standards. The objectives of our performance audit were to review a statistically valid sample of NSF's Q2 FY 2017 spending data; assess the accuracy, completeness, timeliness, and quality of the data sampled; and assess NSF's implementation and use of the Government-wide data standards.

Kearney noted that the spending data NSF submitted did not meet the quality requirements as outlined by OMB. Several data elements were inaccurate, incomplete, or untimely because NSF did not have sufficient quality control procedures and there were reporting issues at the Government-wide reporting level. Kearney identified total inaccuracies in one or more data elements for 62.2 percent of the selected samples tested; specifically 43.3 percent of transactions had errors due to NSF's attributed errors and 18.9 percent had errors due to Government-wide reporting issues. We also identified that 98.8 percent of the transactions tested omitted one or more of the required data elements; specifically 41.7 percent were due to NSF's attributed errors and 57.1 percent were due to Government-wide reporting issues. Finally, Kearney identified 0.8 percent of transactions that were not reported within 30 days after the end of the quarter.

As required by OMB guidance, we calculated our sampling error at the transaction level, rather than the data element level. Therefore, if one or more of the data elements within a transaction was inaccurate, then the entire transaction was deemed an error. Inaccurate, incomplete, and untimely data may not reflect complete information for the end user. As a result, if the data remains uncorrected, there is a risk that inaccurate and incomplete data will be uploaded to USASpending.gov, decreasing the reliability and usefulness of the data. Finally, Kearney noted that NSF had taken many steps to implement and use data standards required by Federal guidance; however, improvements are needed.

As a result of our findings, we made four recommendations to improve NSF's implementation of the DATA Act. We provided these findings and recommendations, as well as a draft version of this report, to management for comment. Management's response is included in its entirety in Appendix E.

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[1] Public Law (P.L.) No. 113-101

OBJECTIVE

The objectives of this audit were to review a statistically valid sample of NSF's Q2 FY 2017 spending data; assess the accuracy, completeness, timeliness, and quality of the data sampled; and assess NSF's implementation and use of the Government-wide data standards.

BACKGROUND

In 2016, the Federal Government spent more than $3 trillion in payments to vendors, contractors, and grantees in the form of contracts, grants, loans, and other financial awards.[2] To increase the transparency of and accountability for that spending, Congress passed the Federal Funding Accountability and Transparency Act (FFATA) in 2006.[3] The act, as amended by the Government Funding Transparency Act of 2008,[4] requires OMB to ensure the existence and operation of a free, publicly accessible website containing data on Federal awards (e.g., contracts, loans, and grants). In order to comply with FFATA requirements, OMB launched the USASpending.gov website.

In May 2014, the DATA Act was signed into law. The DATA Act amends and augments FFATA to increase accountability, transparency, accessibility, quality, and standardization in Federal spending data. The DATA Act requires agency financial and payment information to be reported to the public through USASpending.gov in accordance with Government-wide financial data standards developed and issued by OMB and Treasury, beginning with FY 2017 second quarter data.

The DATA Act also requires that the Inspector General (IG) of each Federal agency periodically review a statistically valid sample of the spending data submitted by its agency; assess the completeness, timeliness, quality, and accuracy of the data sampled; and assess the agency's implementation and use of Government-wide financial data standards. The IGs are required to submit to Congress and make publicly available a report of the results of these assessments. In February 2017, the Council of the Inspectors General on Integrity and Efficiency (CIGIE), Federal Audit Executive Council, DATA Act Working Group, in consultation with the Government Accountability Office (GAO), developed the *Inspector General Guide to Compliance Under the DATA Act* that provided OIGs with a framework for the work required by the DATA Act.[5]

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[2] Department of the Treasury (Treasury), https://beta.usaspending.gov/#/ (accessed on September 26, 2017). This amount includes total spending awarded to individuals, private contractors, and local Governments, and it excludes the cost of running the Government and direct services (i.e., non-award spending or money that was not given out through contracts, grants, direct payments, loans, or insurance).
[3] P.L. No. 109-282, § 1 to 4 (September 26, 2006)
[4] P.L. No. 110-252 (June 30, 2008)
[5] This report is the required report described in the DATA Act. For details regarding the scope and methodology, including use of the *Inspectors General Guide to Compliance Under the DATA Act* (Treasury OIG, OIG-CA-17-012, February 2017), see Appendix A of this report.

Guidance Related to Federal Agency Accountability and Transparency

OMB has published several sources of implementation guidance relating to FFATA and the DATA Act to facilitate consistency and compliance across Federal agencies. In addition, Treasury published technical guidance to assist agencies in understanding the various files and data elements of the DATA Act submissions and the functionality of the Treasury's Broker (Broker). Notable sources of guidance available to agencies include:

- OMB-M-10-06, *Open Government Directive*, provides guidance for Executive departments and agencies to implement the principles of transparency and open Government. This includes publishing Government information online and taking steps toward improving the quality of Government information published. OMB also published the *Open Government Directive – Federal Spending Transparency* and the *Open Government Directive – Framework for the Quality of Federal Spending Information* to provide guidance to Federal agencies in implementing the requirements in OMB-M-10-06.

- OMB-M-15-12, *Increasing Transparency of Federal Spending by Making Federal Spending Data Accessible, Searchable, and Reliable*, provides guidance to Federal agencies on the existing data reporting requirements pursuant to the FFATA, as well as new requirements that agencies must employ pursuant to the DATA Act. This guidance requires agencies to establish a linkage between their financial, grants, and procurement management systems, which is a key component to tracking spending more effectively. OMB M-15-12 specifies that agency implementation plans should: 1) identify a Senior Accountable Official (SAO); 2) estimate resource requirements; 3) propose an implementation timeline; and 4) identify foreseeable challenges and resolutions.

- OMB Management Procedures Memorandum (MPM) No. 2016-03, *Additional Guidance for DATA Act Implementation: Implementing Data-Centric Approach for Reporting Federal Spending*, offers additional guidance to Federal agencies on reporting Federal appropriations account summary-level and Federal award-level data to USASpending.gov in accordance with FFATA, as amended by the DATA Act. This memo also discusses the requirement for Federal agencies to associate data in agency financial systems with a unique award identification number (Award ID) to facilitate the linkage of these two levels of data.

- OMB-M-17-04, *Additional Guidance for DATA Act Implementation: Further Requirements for Reporting and Assuring Data Reliability*, provides additional guidance to Federal agencies on reporting to USASpending.gov. This guidance offers specific technical assistance on certain matters such as awards involving intragovernmental transfers and quarterly SAO assurances.

- Treasury issued the DATA Act Information Model Schema (DAIMS), Version.1.1, to be the authoritative source for the terms, definitions, formats, and structures of the data

elements. DAIMS provides requirements for Federal agencies on reporting to the DATA Act Broker.

- *Federal Spending Transparency Data Standards*, in accordance with the DATA Act, OMB, and Treasury, established the set of 57 Government-wide data standards[6] for Federal funds made available to or expended by Federal agencies. Agencies are required to report financial data in accordance with these standards beginning in Q2 of FY 2017.

DATA Act Submission and Certification

To facilitate compliance with the DATA Act, which required data to be published on USASpending.gov by May 8, 2017, Treasury mandated Federal agencies to submit FY 2017 Q2 data to the DATA Act Broker by April 30, 2017. Treasury developed an information technology (IT) system, the DATA Act Broker, to facilitate the submission of data for the DATA Act. Agencies are required to use the Broker[7] to upload three files containing data from their internal systems and records. In addition, agencies use the Broker to extract award and sub-award information from existing Government-wide reporting systems to generate four additional files. The SAO is then required to certify and submit all seven of the files in the Broker. *Exhibit 1* and *Exhibit 2* provide details on the seven files.

Exhibit 1: Agency-Created Files

DATA Act Submission File	File Description
File A – Appropriations Account Detail	File A provides information about how budgetary resources are made available and the status of budgetary resources at the end of the reporting period. File A includes six of the 57 required data elements, including the amount appropriated and obligated[8] during the FY. The information in File A is reported for each Treasury Account Symbol (TAS).[9] File A data is reported at the summary level, rather than the individual transaction level.

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[6] The 57 standard data elements, including their definitions, can be found in Appendix B of this report. They are also available at https://fedspendingtransparency.github.io/data-elements/ (as of September 14, 2017).

[7] OMB MPM 2016-03, *Additional Guidance for DATA Act Implementation: Implementing Data-Centric Approach for Reporting Federal Spending*, requires agencies to submit data required by the DATA Act directly to Treasury. Treasury issued the DAIMS, v.1.1, which directed agencies to complete the submission through the Broker.

[8] Obligations are definite commitments that create a legal liability of the Government for payment.

[9] A TAS represents individual appropriation, receipt, and other funds made available to Federal agencies. The TAS is used to segregate funds to ensure that funds are spent in accordance with law.

DATA Act Submission File	File Description
File B – Object Class and Program Activity Detail	File B includes the same six data elements as File A; however, the information in File B is presented by program activity[10] and object class, which represent an additional two required data elements.[11] Similar to File A, File B data is reported at the summary level, rather than the individual transaction level.
File C – Award Financial Data	File C includes transaction-level information for all awards, procurement, and financial assistance (e.g., grants and cooperative agreements) processed during the quarter. This includes modifications to existing awards. Payroll actions, classified transactions, and interagency awards are excluded from agency submissions. File C includes four of the 57 required data elements: the TAS, Award Identification Number, Obligation, and Object Class. All records in File C should be included in either File D1 or D2, which are described below.

Source: Generated by Kearney based on OMB and Treasury guidance.

Exhibit 2: DATA Act Broker-Generated Files

DATA Act Submission File	File Description
File D1– Award and Awardee Attributes (Procurement)	File D1 includes transaction-level information for all procurement awards processed during Q2 of FY 2017. File D1 comprises 41 of the 57 required data elements, including Award ID, Award Description, Place of Performance, and Period of Performance. Records can be traced from File D1 to File C using the Award ID.

When agencies generate File D1 in the DATA Act Broker, the Broker pulls the information from the Government-wide Treasury Federal Procurement Data System – Next Generation (FPDS-NG). Agencies are required to report all contracts with an estimated value over $3,500 and modifications to those contracts into FPDS-NG. |
| File D2– Award and Awardee Attributes (Financial Assistance) | File D2 includes transaction-level information for all financial awards processed during Q2 of FY 2017. File D2 comprises 38 of the 57 required data elements, including Award ID, Awardee/Recipient Legal Entity Name, Place of Performance, and Period of Performance. Records can be traced from File D2 to File C using the Award ID. |

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[10] A specific activity or project as listed in the program and financing schedules of the annual budget of the United States Government.

[11] Object classifications identify the kinds of services, materials, and other resources for which U.S. Government payments are made. They cover all types of obligations, payments, current operating expenses, and capital outlays. The basic object classes are prescribed by OMB Circular A-11, *Preparation, Submission and Execution of the Budget*.

DATA Act Submission File	File Description
	When agencies generate File D2 in the Broker, the Broker pulls the information from the Government-wide Treasury Award Submission Portal (ASP) for all awards reported during Q2. Agencies are required to report all financial assistance awards of $25,000 or more to the ASP monthly.
File E – Additional Awardee Attributes	File E includes information on organizations which received procurement or financial assistance awards during Q2 of FY 2017. File E includes five of the 57 required data elements. Three of these data elements are used to identify the awardee and are included for all organizations with awards in Q2. The remaining two required data elements are only reported for organizations which receive over 80% or $25,000,000 of their annual gross revenues in Federal funding.[12] These elements are the names of the five most highly compensated officers and the total compensation for these individuals. When agencies generate File E in the Broker, the Broker pulls the information from the General Services Administration's (GSA) System for Award Management (SAM). All organizations which currently or want to conduct business with the Federal Government must have an active registration in SAM.
File F – FFATA Sub-award Attributes	File F includes information on certain organizations which received procurement or financial assistance sub-awards during Q2 of FY 2017. When agencies generate File F in the Broker, the Broker pulls information from the FFATA Sub-award Reporting System (FSRS). If a prime contractor issues a sub-award for more than $30,000 or if a prime grantee issues a sub-award for more than $25,000, the prime contractor/grantee must report the sub-award in FSRS. In addition to details about the sub-award, the prime contractor/grantee is also required to report information on the executive compensation of the organization to which the sub-award was issued. Because File F did not contain any required data elements as part of the DATA Act file submission, we did not perform any testing procedures over those data elements reported.

Source: Generated by Kearney based on OMB and Treasury guidance.

The responsibility for ensuring the accuracy of all files lies with an agency's DATA Act SAO.. Each agency is required to designate a SAO, who is a senior official in the agency with the

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[12] The Office of Federal Procurement Policy Act, as amended, 41 United States Code (U.S.C.) 401 et.seq., and Federal Acquisition Regulation (FAR), Subpart 52.204-10.

ability to coordinate across multiple communities and Federal Lines of Business.[13] Although OMB guidance does not name a position within the agency that should be the SAO, it states that the SAO should be accountable for the quality and objectivity of internal controls over spending information. The SAO must provide reasonable assurance over the quality of the data submitted and document his/her assurance by certifying the DATA Act submission in the Broker. OMB guidance directs SAOs to verify that there are the required linkages among all of the files prior to certification. For example, for those awardees included in File E, there should be transactions in Files C and D1 or C and D2. OMB guidance further states that when certifying the DATA Act submission, SAOs should "provide reasonable assurance that their internal controls support the reliability and validity of the agency account-level and award-level data."[14]

The NSF's Process for Generating the Data Act Submission

At NSF, the Deputy Head of the Office of Budget, Finance, and Award Management serves as the SAO.[15] Accordingly, the Office of the Chief Financial Officer (OCFO) is responsible for the implementation of the DATA Act at NSF. On April 28, 2017, NSF uploaded and certified the required files in the DATA Act Broker. The data needed to create Files A, B, and C resides in NSF's core financial management system, iTRAK, and is generated by NSF. Using the DATA Act Broker, NSF extracted and generated the Files D1, D2, E, and F for submission on April 28, 2017. As noted above, the source for these files are Government-wide reporting systems. *Exhibit 3* outlines how each file is populated into each of these systems.

Exhibit 3: Process for Reporting Information in Government-wide Systems which are the Sources for Files D1, D2, E, and F

DATA Act Submission File	Government-wide Source System	Process for Reporting Data to the Government-wide Source System
File D1– Award and Awardee Attributes (Procurement)	FPDS-NG	As noted above, File D1 is generated based on the information included in FPDS-NG. iTRAK is configured so that when a procurement is recorded in iTRAK, certain fields will be automatically transmitted to FPDS-NG, creating a new record in FDPS-NG. However, this process does not automatically populate all required fields in FPDS-NG. The Contracting Officer (CO) enters the remaining fields directly into FPDS-NG. Once the CO completes all of the required fields in FPDS-NG, he/she clicks the Verify button. The action must pass automatic edit checks in FPDS-NG to be recorded, which is noted by a "Final" status.

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[13] OMB-10-06, Section 2 a., *Open Government Directive*
[14] OMB-M-17-04, *Additional Guidance for DATA Act Implementation: Further requirements for Reporting and Assuring Data Reliability*
[15] The NSF's SAO is currently the Acting Chief Financial Officer (CFO).

DATA Act Submission File	Government-wide Source System	Process for Reporting Data to the Government-wide Source System
File D2– Award and Awardee Attributes (Financial Assistance)	ASP	As noted above, File D2 is generated based on the information included in ASP. NSF's Awards system is an internal system to record financial awards, which interfaces with iTRAK. Subsequently, the financial award data reported in Awards is uploaded by NSF to ASP on a monthly basis.
File E – Additional Awardee Attributes	SAM	Populated by vendors/awardees.
File F – FFATA Sub-award Attributes	FFATA Sub-award Reporting System	Populated by awardees.

Source: Generated by Kearney based on OMB and Treasury guidance.

AUDIT RESULTS

Kearney noted that the data reported in Files A and B was accurate, complete, timely, and met the quality requirements outlined by OMB. We noted that there are six elements that are tested within Files A and B; therefore, they are not tested as a part of Files C, D1/D2, or E. Kearney noted that File F did not contain any required data elements as part of the DATA Act file submission. Thus, we did not perform any testing procedures over those data elements reported in File F.

We reviewed a statistically valid sample of spending data (254 transactions) that NSF submitted under the DATA Act to assess the data reported in Files C, D1, D2, and E, and Kearney noted that data reported in Files C, DI, D2, and E was inaccurate, incomplete, and untimely. Accordingly, these items did not meet quality requirements as outlined by OMB.[16] Specifically, of the 6,603 transactions included in NSF's File C submission, Kearney reviewed a sample of 254 transactions and determined that 62.2 percent of transactions were inaccurate, 98.8 percent of transactions were incomplete, and 0.8 percent of transactions were untimely. Each transaction reported (Files C, D1/D2, and E) may contain up to 51 required data elements (See Appendix B for the data element mapping) that may be tested for completeness, accuracy, and timeliness. If any of the data elements result in an error (even if it is just one), this causes the entire transaction to be considered an error.

We identified three types of errors, two of which are Government-wide reporting errors (Broker errors and ASP errors) at the Treasury level, which are both outside of NSF's control. See Appendix A for a description of broker data reporting issues. Certain other data elements were derived by ASP (i.e., Funding Office Name and Awarding Office Name). As a result, we calculated separate rates for NSF errors, the Broker errors, and ASP derived errors to distinguish between the nature and extent of the variances identified at the transaction level. For accuracy, 43.3 percent of the transactions had errors due to NSF, while 18.5 percent of the transactions had errors due to ASP, and 0.4 percent of the transactions had errors due to the Treasury Broker. For completeness, 41.7 percent of the transactions tested were incomplete due to NSF's attributed errors, while 57.1 percent were incomplete due to ASP. See *Exhibit 4* for summary results of testing.

Finally, Kearney noted that NSF had taken many steps to implement and use data standards required by Federal guidance; however, improvements are needed.

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[16] OMB's *Open Government Directive – Federal Spending Transparency* requires agencies to report on three key metrics: timeliness, completeness, and accuracy. These are the metrics that will be used to determine the quality of information.

Exhibit 4: Summary Results of Testing

Results	Accuracy	Completeness	Timeliness	Quality
Number of Transactions Without Errors	96	3	252	96
Number of Transactions With Errors in One of More Data Element[17]				
Number of Transactions with Errors Due to Data Elements Controlled by NSF	110	106	2	110
Number of Transactions with Errors Due to the Broker[18]	1	0	0	1
Number of Transactions with Errors Due to Data Elements Derived by ASP	47	145	0	47
Total Errors (NSF, Broker, and ASP)	**158**	**251**	**2**	**158**
Total Number of Transactions Tested	254	254	254	254
Percentage Error Due to Data Elements Controlled by NSF	43.3%	41.7%	0.8%	43.3%
Percentage Error Due to the Broker	0.4%	0.0%	0.0%	0.4%
Percentage Error Due to Data Elements Derived by ASP	18.5%	57.1%	0.0%	18.5%
Total Percentage Errors	**62.2%**	**98.8%**	**0.8%**	**62.2%**

Source: Generated by Kearney based upon the results of testing.

Finding 1: Instances of Inaccurate Data Elements

Condition: To test the accuracy of the award-level transactions in Files C, D1, D2, and E, Kearney selected a sample of 254 transactions (244 Financial Assistance Identifier Number [FAIN] transactions and 10 Procurement Instrument Identifier Data [PIID] transactions) included in NSF's File C submission. For each sampled transaction, Kearney evaluated whether the 51 standard data elements included in Files C, D1, D2, and E were accurate (see Appendix B). Specifically, Kearney obtained supporting documentation, such as a contract, modification, or system screen prints, and agreed the data included in the Files C through E submission to the supporting documents. We determined that 158 transactions (62.2 percent) contained accuracy errors with one or more data elements. The detailed results are presented in *Exhibit 5*.

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[17] Kearney identified three types of errors during testing. ASP and Broker errors (Government-wide Reporting Issues) consists of transactions that had discrepancies for ASP or Broker data elements only (no NSF-controlled errors). NSF-controlled errors consists of transactions that had one or more errors related to NSF populated data elements.

[18] Refer to Appendix A for the full description of the Government-wide Treasury Broker-related errors.

For example, for 56 of the tested transactions (22 percent), Kearney noted that the legal entity address in File D2 was inaccurate. Thirty-four of the tested transactions (13.4 percent) contained inaccurate elements within the Primary Place of Performance Address, which is made up five individual fields, including Primary Place of Performance City Name and Primary Place of Performance ZIP + 4, which contained 25 and six inaccuracies, respectively. Further, for 28 of the tested transactions (11 percent), the Award Type did not agree to the Awards system.

Exhibit 5 shows the data elements with accuracy errors. See Appendix D for the testing results of all 57 data elements by file name.

Exhibit 5: Accuracy Results by Data Element (Errors Only)

Data Element	Number of Transactions without Errors	Number of Transactions with Errors
Action Date	253	1
Award Type	226	28
Awarding Office Name^	103	151
Business Types	253	1
Catalog of Federal Domestic Assistance Title^	253	1
Current Total Value of Award*	253	1
Federal Action Obligation	250	4
Funding Office Code	252	2
Funding Office Name^	103	151
Legal Entity Address	198	56
Legal Entity Congressional District^	246	8
Potential Total Value of Award*	253	1
Primary Place of Performance Address	220	34
Primary Place of Performance Congressional District^	247	7
Primary Place of Performance County Name*	103	151
Ultimate Parent Legal Entity Name**	208	46
Ultimate Parent Unique Identifier**	218	36

Source: Generated by Kearney based upon the results of testing.
*Denotes a Government-wide Treasury Broker data element.
**For FAINs, the data element is only reported on File E (these elements are derived by SAM and were not included within our sampling error rate calculation).
^Denotes an ASP derived data element.

Cause: Insufficient quality control procedures led to inaccuracies reported between Files C, D1/D2, and E. While NSF did make corrections based on erroneous transactions, there was not a complete reconciliation performed which showed effective linkage between Files C to D1/D2 prior to submission. NSF elected to rely on the Broker outputs/results to identify data discrepancies, which resulted in inaccuracies with many of the elements and transactions.

Kearney also noted that certain data elements are derived within ASP and FPDS-NG from other NSF controlled data elements. For example, within FPDS, the Legal Entity Congressional District is populated based on the Legal Entity Zip Code. If NSF enters the incorrect zip code in FPDS, then the Legal Entity Congressional District will be inaccurate.

Certain derived fields are unable to be populated by NSF, thus being outside of NSF's control. For example, NSF entered the Awarding Office Code, from which the Broker should derive the Awarding Office Name within ASP. In this case, the Broker did not populate the required information, resulting in an ASP error.

Finally, it is the awardee's responsibility to report award and executive compensation information in SAM (data within File E). However, it is NSF's responsibility to ensure this information is correct and accurate as a part of its file submissions.

Effect: Due to the inaccurate transactions reported as part of the DATA Act file submissions, Government-wide data reporting issues, and ASP's deriving certain data elements, the data may not accurately reflect factual information for the end user. As a result, there is a risk that inaccurate data will be uploaded to USAspending.gov, decreasing the reliability and usefulness of the data.

Finding 2: Instances of Incomplete Data Elements

Condition: To test the completeness of the award-level transactions in Files C, D1, D2, and E, Kearney selected a sample of 254 (244 FAINs and 10 PIIDs) transactions included in NSF's File C submission. We tested each transaction to determine whether the transaction included all applicable data elements required by the DATA Act. We noted that 251 transactions (98.8 percent) had completeness errors with one or more of the 51 required data elements at the transaction level; specifically 41.7 percent were due to NSF's attributed errors and 57.1 percent were due to Government-wide reporting issues. Of the 254 transactions, 95 (37 percent) were incomplete because they were included in File C but not in Files D1 or D2.[19] The remaining 151 transactions were included in Files C and D1 or D2 but contained incomplete information in one or more of the required data elements. For example, the ultimate parent legal entity name field in File D1 was blank for seven tested procurement awards transactions. *Exhibit 6* illustrates the specific completeness issues encountered during testing.

Exhibit 6: Completeness Results by Data Element (Errors Only)[20]

Data Element	Number of Transactions without Errors	Number of Transactions with Incomplete Data Elements Due to File D1/D2 being Incomplete	Number of Transactions with Errors for Reasons other than File D1/D2 being Incomplete
Action Date	159	95	0
Action Type	159	95	0
Amount of Award	161	93	0
Award Description	159	95	0
Award Modification/Amendment Number	159	95	0
Award Type	159	95	0
Awardee/Recipient Legal Entity Name	159	95	0
Awardee/Recipient Unique Identifier	159	95	0
Awarding Office Code	159	95	0
Awarding Office Name^	8	95	151
Awarding Sub Tier Agency Code	159	95	0
Awarding Sub Tier Agency Name	159	95	0
Business Types	161	93	0
Catalog of Federal Domestic Assistance Number	161	93	0
Catalog of Federal Domestic Assistance Title^	161	93	0

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[19] Kearney did not consider these as exceptions for accuracy, as it would result in a double-counting of errors. In addition, since data was not provided, we could not determine the accuracy of the missing elements.
[20] If a transaction contained multiple errors, it would appear as a part of multiple data elements, therefore causing the total amounts to be larger than the sample.

Data Element	Number of Transactions without Errors	Number of Transactions with Incomplete Data Elements Due to File D1/D2 being Incomplete	Number of Transactions with Errors for Reasons other than File D1/D2 being Incomplete
Current Total Value of Award*	252	2	0
Federal Action Obligation	159	95	0
Funding Agency Code	159	95	0
Funding Agency Name	159	95	0
Funding Office Code	159	95	0
Funding Office Name^	8	95	151
Funding Sub Tier Agency Code	159	95	0
Funding Sub Tier Agency Name	159	95	0
Legal Entity Address	159	95	0
Legal Entity Congressional District^	159	95	0
Legal Entity Country Code	159	95	0
Legal Entity Country Name	252	2	0
North American Industrial Classification System Code	252	2	0
North American Industrial Classification System Description	252	2	0
Ordering Period End Date	252	2	0
Period of Performance Current End Date	159	95	0
Period of Performance Potential End Date	252	2	0
Period of Performance Start Date	159	95	0
Potential Total Value of Award*	252	2	0
Primary Place of Performance Address	159	95	0
Primary Place of Performance Congressional District^	159	95	0
Primary Place of Performance Country Code	159	95	0
Primary Place of Performance County Name*	10	0	244
Record Type	161	93	0
Ultimate Parent Legal Entity Name**	211	2	41
Ultimate Parent Unique Identifier**	222	2	30

Source: Generated by Kearney based upon the results of testing.
*Denotes a Government-wide Treasury Broker data element.
**For FAINs, the data element is only reported on File E (these elements are derived by SAM and were not included within our sampling error rate calculation).
^Denotes an ASP derived data element.

Cause: Insufficient quality control procedures led to incomplete information being reported between Files C, D1/D2, and E. The data was ultimately reported incorrectly within FPDS/ASP due to NSF not performing reconciliations between Files C to D1/D2 and E to identify incomplete transactions, whether fully or partially omitted.

Incomplete transactions that were identified within File D1 (two transactions out of 10) were due to timing issues (see the *Instances of Untimely Transactions* finding for further details).

Management indicated that 93 of the 244 FAIN transactions (38 percent), which were in Files C and not in File D2, were accounting adjustments. These adjustments were made within the financial system (iTRAK), however, they were not recorded within the Awards system; thus, they did not appear in File D2.

Effect: Due to the incomplete transactions or data elements omitted as part of the DATA Act file submissions, the data may not reflect factual and complete information for the end user. As a result, NSF runs the risk that incomplete data will be uploaded to USAspending.gov, decreasing the reliability and usefulness of the data.

Finding 3: Instances of Untimely Transactions

Condition: To test the timeliness of the award-level transactions in Files C, D1, D2, and E, Kearney selected a sample of 254 (244 FAINs and 10 PIIDs) transactions included in NSF's File C submission. For each sampled transaction, we determined whether the information for the transaction was reported within 30 days after quarter-end. Kearney noted while most of NSF's data was reported timely, two transactions (0.8 percent) were not recorded in the files within 30 days.

Cause: NSF used the Broker to generate Files D1, D2, E, and F for submission and certification on April 30, 2017, which is 30 days after the end of Q2. At that time, the Broker created Files D1 and D2 based upon the information included in FPDS-NG and ASP, respectively. Records, which were not in these systems, were not included in the DATA Act files. We noted two of the 10 transactions sampled were not included in File D1 because NSF did not report them timely to FPDS-NG. Kearney reviewed the source documentation for the two untimely samples and determined that they represented actual Q2 activity, which should have been reported in File D1.

Effect: Most of NSF's data was recorded timely; however, when transactions are not reported timely in NSF's DATA Act file submissions, data may not properly reflect information for that time. As a result, NSF runs the risk that incomplete data will be uploaded to USAspending.gov, decreasing the reliability and usefulness of the data.

Finding 4: Issues with DATA Quality

Condition: We determined that if a transaction was inaccurate, the data reported would not include the proper conditions to meet quality standards as established by OMB. Of the 254 sampled transactions, 158 (62.2 percent) contained errors with the accuracy, completeness, and/or timeliness of one or more data elements reported in Files C, D1, D2, or E. These errors occurred despite the fact that Kearney noted that NSF had taken many steps to successfully implement and use the data standards. For example, NSF took steps to enhance its ability to compile, analyze, and reconcile data from multiple sources. However, improvements are needed to reduce data quality issues and fully implement the data standards for all transactions.

Cause: Quality issues primarily occurred because management had insufficient quality control procedures to ensure that data was entered into ASP and FPDS-NG accurately, completely, and timely.

NSF populates certain data elements with ASP and FPDS-NG, which subsequently triggers other elements to be derived, such as Funding Office Name and Awarding Office Name. NSF cannot correct discrepancies within these data elements (i.e., ASP and FPDS-NG derived fields) because they are not controlled by NSF.

Effect: Due to the inaccurate transactions reported as part of the DATA Act file submissions, Government-wide data reporting issues, and ASP's deriving certain data elements, the data may not accurately reflect quality information for the end user. As a result, NSF runs the risk that inaccurate data will be uploaded to USAspending.gov, decreasing the reliability and usefulness of the data.

Audit Result Recommendations

Recommendation 1: Kearney recommends that NSF develop and implement procedures to validate the accuracy of the data reported to the FPDS-NG and ASP, including procedures to ensure the accuracy of data entered into NSF-owned systems, which interface with FPDS-NG and ASP.

Recommendation 2: Kearney recommends that NSF perform an assessment over the linkage between Files C to D1/D2 to ensure compliance with DATA Act requirements and standards. NSF should implement controls to confirm the completeness of data entered into NSF-owned systems (iTRAK and Awards), which is submitted to FPDS-NG and ASP on a periodic basis.

Recommendation 3: Kearney recommends that NSF develop and implement a process (i.e., perform reconciliations) to enter procurement transactions into the Government-wide FPDS-NG within 30 days of the end of the quarter.

Recommendation 4: Kearney recommends that NSF expand and improve upon existing internal quality control procedures to confirm the accuracy and integrity of the data prior to submission to allow the SAO to appropriately certify all data included in files.

APPENDIX A: PURPOSE, SCOPE, AND METHODOLOGY

Purpose, Scope, and Methodology

The Digital Accountability and Transparency Act of 2014[21] (DATA Act) requires each Federal agency Inspector General (IG) to review a statistically valid sample of the spending data submitted by its agency; assess the completeness, timeliness, quality, and accuracy of the data sampled; and assess the agency's implementation and use of Government-wide financial data standards. The Office of Inspectors General (OIG) are required to submit to Congress and make publicly available a report of the results of the assessment.

The objective of this audit was to comply with the aforementioned requirement. An external audit firm, Kearney & Company, P.C. (referred to as "Kearney," "we," and "our" in this document), acting on behalf of the National Science Foundation (NSF) OIG, performed the audit.

Kearney conducted fieldwork for this performance audit from May through October 2017 in the Washington, D.C. metropolitan area. The audit was conducted in accordance with the Government Accountability Office's (GAO) *Government Auditing Standards*, 2011 Revision. These standards require that Kearney plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for the findings and conclusions based on the audit objective. We believe that the evidence obtained provides a reasonable basis for the findings and conclusions based on the audit evidence.

In February 2017, the Council of the Inspectors General on Integrity and Efficiency's (CIGIE) Federal Audit Executive Council, in consultation with GAO, published the *Inspectors General Guide to Compliance Under the DATA Act*,[22] which served to provide IGs with a baseline framework for DATA Act compliance reviews.

According to the *Inspectors General Guide to Compliance Under the DATA Act*, to accomplish the objectives of the DATA Act compliance review, IGs should:

- Obtain an understanding of any regulatory criteria related to its agency's responsibilities to report financial and award data under the DATA Act.
- Assess its agency's systems, processes, and internal controls in place over data management under the DATA Act.
- Assess the general and application controls pertaining to the financial management systems (e.g., grants, loans, procurement) from which the data elements were derived and linked.
- Assess its agency's internal controls in place over the financial and award data reported to USASpending.gov per Office of Management and Budget (OMB) Circular A-123.

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[21] Public Law (P.L.) No. 113-101
[22] Department of the Treasury (Treasury) OIG Report No. OIG-CA-17-012 (February 27, 2017)

- Review a statistically valid sample from fiscal year (FY) 2017 second quarter (Q2) financial and award data submitted by the agency for publication on www.USASpending.gov.
- Assess the completeness, timeliness, quality, and accuracy of the financial and award data sampled:
  - Completeness is measured in two ways: 1) all transactions that should have been recorded are recorded in the proper reporting period and 2) as the percentage of transactions containing all applicable data elements required by the DATA Act.
  - Timeliness is measured as the percentage of transactions reported within 30 days of quarter-end.
  - Accuracy is measured as the percentage of transactions that are complete and agree with the systems of record or other authoritative sources.
  - Quality is defined as a combination of utility, objectivity, and integrity.
- Assess its agency's implementation and use of the 57 data definition standards established by OMB and Treasury.

In accordance with the *Inspectors General Guide to Compliance Under the DATA Act*, the scope of this audit was NSF's submission of FY 2017 Q2 data. The *Inspectors General Guide to Compliance Under the DATA Act* stated: "the [OIG] engagement team, to the extent possible, should adhere to the overall methodology, objectives, and review procedures outlined in this guide. The engagement team should not hesitate to modify this guide based on specific systems and controls in place at its agency, but must use professional judgment when designing alternative review procedures." Generally, Kearney conducted our audit based upon this guidance. Professional judgement was used to customize certain recommended testing procedures based on NSF's environment, systems, and data.

To obtain background information, Kearney researched and reviewed Federal laws and regulations, as well as prior GAO audit reports. We also reviewed the United States Code (U.S.C.), OMB Circulars and Memoranda, guidance published by Treasury, and information available on NSF's intranet.

Kearney met with NSF officials to gain an understanding of the processes used to implement and use the data standards. Specifically, we obtained an understanding of the processes used to create and perform quality controls on the DATA Act submission. This included understanding the systems used to process procurement and financial assistance awards. Kearney also obtained an understanding of processes to record procurement and financial assistance awards in NSF's systems and other Federal systems.

The *Inspectors General Guide to Compliance Under the DATA Act* instructed audit teams to assess the agencies' use and implementation of 57 standard data elements.[23] Six of these data elements are reported at the summary level in Files A or B, rather than the individual transaction level. As reported in the *AUDIT RESULTS* section of this report, to test these data elements,

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[23] The 57 standard data elements, including their definitions, are included in Appendix B of this report. They are also available at https://fedspendingtransparency.github.io/data-elements/ (as of September 14, 2017).

Kearney tested procedures implemented by NSF to confirm the validity and accuracy of these six account summary-level data elements. Specifically, we confirmed that the data was appropriately linked between Files A and B and Standard Form (SF)-133, *Report on Budget Execution and Budgetary Resources.* For the remaining 51 data elements, Kearney selected a sample of individual transactions included in NSF's File C submission. See additional details in the ***Detailed Sampling Methodology*** section of this appendix.

Testing Limitations for Data Reported from Files E and F

As noted above in ***Exhibit 2***, File E contains additional awardee attribute information extracted from the System for Award Management (SAM) via the Treasury Broker (Broker), and File F contains sub-award attribute information extracted from the Federal Funding Accountability and Transparency Act of 2006 (FFATA) Sub-award Reporting System (FSRS) via the Broker. It is the prime awardee's responsibility to report sub-award and executive compensation information in SAM and FSRS. Data reported from these two award reporting systems is generated in the Broker for display on USASpending.gov. As outlined in OMB's Management Procedures Memorandum (MPM) 2016-03, the authoritative sources for the data reported in Files E and F are SAM and FSRS, respectively, with no additional action required of Federal agencies.

Government-Wide Broker Data Reporting Issues

Throughout the course of the audit, Kearney became aware of the following Government-wide broker data reporting issues, which we segregated from our results to focus on NSF's implementation of the DATA Act.

Current Total Value of Award and Potential Total Value of Award Errors for Procurement Award Modifications

Data from the Current Total Value of Award and Potential Total Value of Award elements is extracted from the Federal Procurement Data System – Next Generation (FPDS-NG) via the legacy USASpending.gov and provided to the Broker.[24][25] Specifically, data for these elements is extracted from the following FPDS-NG fields, respectively: 1) base and exercised options value and 2) base and all options' value. These two fields are categorized in FPDS-NG under two columns for data entry labeled "Current" and "Total." The "Current" column contains amounts entered into the system by the agency. The "Total" column contains cumulative amounts computed by FPDS-NG based on the modification amounts entered into the system by the agency. Procurement award modifications, included in our sample, reported values for these elements from FPDS-NG's "Current" column, which displays the modification amount, rather than the "Total" column, which displays the total award value. As a result, data for the Current Total Value of Award and Potential Total Value of Award elements was inconsistent with

[24] OMB defines the current Total Value of Award data element as the total amount obligated to date on a contract, including the base and exercised options. Potential Total Value of Award is defined by OMB as the total amount that could be obligated on a contract if the base and all options are exercised.
[25] The legacy USASpending.gov uses FPDS, v.1.4, to extract and map that data from FPDS-NG. This was a one-time extraction for Q2 transactions.

agency records. A no-cost modification would cause the "Total" column to display an erroneous zero balance. Procurement awards (base awards) that were not modified did not produce these same errors. Treasury's Government-wide DATA Act Program Management Office (PMO) officials confirmed that they are aware that the Broker currently extracts data for these elements from the "Current" column rather than the "Total" column. A Treasury official stated that the issue will be resolved once DATA Act Information Model Schema (DAIMS), Version 1.1, is implemented in the Broker and related historical data from USASpending.gov is transferred to https://beta.usaspending.gov during Fall 2017. However, as NSF does not have responsibility for how data is extracted by the Broker, we did not evaluate the reasonableness of Treasury's planned corrective action.

Indefinite Delivery Vehicle (IDV) Type Errors

For procurement awards included in our sample, data from the IDV Type element should be extracted from FPDS-NG and provided to the Broker. The FPDS-NG atom feed[26] delivers the IDV Type and Contract Award Type in the same field. The Broker did not break down the data for IDV Type, which resulted in inconsistencies with agency records. Treasury's DATA Act PMO officials confirmed that they are aware of this issue and have taken steps to avoid this issue in future reporting periods. However, as NSF does not have responsibility for how data is extracted by the Broker, we did not evaluate the reasonableness of Treasury's planned corrective action.

Legal Entity City Code and Primary Place of Performance County Name Errors

The interface definition document (IDD), a DAIMS artifact, states that data from Legal Entity City Code and Primary Place of Performance County Name, for financial assistance awards in File D2, is extracted via Treasury's ASP. During fieldwork, we noted that data for these two fields was consistently blank. A Treasury official stated that data for Legal Entity City Code had not been derived since January 2017 and there were no plans to reconsider how this element would be handled.

The Treasury official further explained that data derived for Primary Place of Performance County Name would not be implemented until September 2017. Because data for these elements was not derived or implemented, these data fields were consistently blank and, therefore, not reported for display on USASpending.gov. However, as NSF does not have responsibility for how data is extracted by the Broker from Treasury's ASP, we did not evaluate the reasonableness of Treasury's planned corrective action.

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[26] FPDS-NG has data reporting web services that provide access in real-time to a central data repository. FPDS-NG also provides real-time feeds of the same contractual data using atom feeds.

Prior Reports

In November 2016, NSF OIG reported[27] one finding regarding NSF's readiness to implement the DATA Act and report the required financial and spending data to Treasury by the April 30, 2017 reporting deadline. Specifically, the readiness review identified that NSF had not fully developed and implemented a detailed plan (e.g., Project Management Plan, Risk Management Plan, Human Resource Plan, Process for Documenting Key Decisions, and Process to Track Data Inventory Gaps) to ensure project tasks and milestones are not missed/overlooked when implementing DATA Act requirements.

Work Related to Internal Controls

Based upon the information obtained from NSF during preliminary audit procedures, Kearney performed a risk assessment that identified audit risks related to the audit objectives. Agency files submitted for the DATA Act are often interrelated and repeat information provided during separate submissions to Treasury and OMB for other purposes. To ensure the accuracy, completeness, timeliness, and quality of the data submitted for the DATA Act, agencies were required to perform quality control procedures of the data prior to submission, including ensuring that there were appropriate linkages between the DATA Act files and the files from existing Government-wide reporting systems.[28] According to DATA Act guidance, agencies are required to confirm that: 1) the information reported in File A matched the March 31, 2017 SF-133; 2) File A matched the totals included in File B;[29] 3) the transactions included in Files C were included in Files D1 or D2, as applicable; and 4) the transactions included in Files D1 and D2, as applicable, were included in File C. Kearney noted that NSF effectively performed these quality control checks between Files A and B. As a result, NSF's reconciliations between File A and the SF-133 and between Files A and B produced no differences. Kearney re-performed these two quality control procedures and also noted no difference. Additionally, through these reconciliations, we validated the required data elements, which are presented in the files.[30]

Although NSF performed the appropriate reconciliations between Files A and B, NSF did not reconcile Files C to D1/D2 and E; therefore, Kearney performed a partial reconciliation between Files C and D1/D2, as well as performed a reconciliation of data linkages between Files C and D1/D2 to Files E and noted various differences. We determined that the linkage discrepancies between transactions reported in Files C to D1/D2 were the result of mostly upward/downward obligation activity reported on File C, but omitted from Files D1/D2. According to NSF management, the agency opted to not report the File C transactions to Files D1/D2 as part of its business practices and operations for procurement and financial award. NSF does not perform the reconciliations to show the appropriate way to relate Files C to D1/D2.

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[27] *DATA Act Readiness Review – NSF Should Take Additional Steps to Ensure Compliance with the DATA Act*, OIG 17-3-001, November 29, 2016
[28] OMB M-17-04, Section 3, *Quarterly SAO Assurance of DATA Act Data*
[29] The NSF also reconciled iTRAK to Governmentwide Treasury Account Symbol Adjusted Trial Balance System (GTAS), as iTRAK was the basis of File B and GTAS was the basis of File A.
[30] Kearney tested the following six data elements through reconciliations: Appropriation Account, Budget Authority Appropriated, Other Budgetary Resources, Outlays, Program Activity, and Unobligated Balance.

In addition to performing this DATA Act audit, Kearney also performs NSF's financial statement and information technology (IT) audits. Accordingly, we relied on this work to test internal controls, specifically related to the DATA Act. Kearney's Financial Audit Team tested controls over grants processing/monitoring, grant closeouts, interface with other awards systems (e.g., eJacket), and the procurement/contracts management process (e.g., obligations). Kearney's T Audit Team tested access controls, separation of duties, and change management as they relate to NSF's iTRAK (i.e., financial accounting system) and Awards systems (i.e., processing all award actions, including funding and non-funding). Kearney relied on this work to understand the internal controls as they related to the DATA Act audit.

Kearney identified additional internal controls, including general and application controls in source systems and controls, to ensure that data was accurate, complete, and timely; however, we chose not to rely on or specifically test those controls to determine NSF's implementation and use of the data standard. Based on the professional judgment of the Audit Team, an approach for testing additional internal controls would be inefficient for purposes of this audit. In addition, Kearney identified data elements that rely solely on accurate human data entry, such as a vendor's place of performance, rather than source system internal controls. Accordingly, we designed additional substantive procedures that would enable us to obtain sufficient and appropriate evidence to conclude upon the audit objectives.

Use of Computer-Processed Data

As discussed in the *BACKGROUND* section of this report, the files included in NSF's DATA Act submission were generated from multiple systems, including NSF-owned systems and systems used across the Federal Government. As the purpose of this audit was to audit the amounts included in this submission by tracing information to source documentation, other than the reconciliations, described in the *AUDIT RESULTS* section of this report, additional steps were not considered necessary to assess the sufficiency of computer-processed data.

Detailed Sampling Methodology

In accordance with the *Inspectors General Guide to Compliance Under the DATA Act*, Kearney selected a sample of certified spending data transactions for transaction-level testing from NSF's Q2 FY 2017 DATA Act File C submission.[31] In accordance with the *Inspectors General Guide to Compliance Under the DATA Act*, Kearney selected a random sample of 254[32] transactions included in File C using sampling software. We used a 20% error rate in determining the sample

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[31] Section 430.01 of the *Inspectors General Guide to Compliance Under the DATA Act* states: "the engagement team should randomly select a statistically valid sample of certified spending data from the reportable award-level transactions included in the agency's certified data submission for File C, or Files D1 and D2 if file C is unavailable." Since Files D1 and D2 are available, Kearney selected the sample from File C.

[32] Section 430.02 of the *Inspectors General Guide to Compliance Under the DATA Act* requires a sample size of 385 transactions using an error rate of 50%; however, it also provides a correction formula for agencies with populations smaller than 385. Applying this correction formula – 385/[1+(385/N)] – to NSF's 6,603 transaction File C population, a sample size of 364 would have been selected. However, Kearney and the NSF OIG determined that a 20% error rate would be more appropriate for our audit, which results in an updated sample size of 254 transactions.

size, as the DATA Act engagement is a performance audit, allowing flexibility in the way the planning and results are reported. Kearney also noted that NSF is a small agency and has received clean opinions on its audit reports for the past 19 years; therefore, the expected risk was lower. We also determined that NSF implemented a new financial reporting system, iTRAK, and there are strong internal controls associated with it. Further, through all of the audits performed, there were no material weaknesses identified within the financial systems; therefore, Kearney and the NSF OIG determined that a 20% error rate would be reasonable based on the parameters listed below:

- Source of Population/Sample – File C (6,603).
- Confidence Level – 95% (Should not change).
- Sample Precision – +-5% (Use 10% in software as it relates to *precision range +/- 5%*).
- Expected Error Rate – 20% (CIGIE Guide recommends an expected error rate of 50%, however, *Exhibit 7* shows different sample size results based on revised error rates).
- Sample Size – 385 or formula (per Section 430.02, Footnote 40 of the *Inspectors General Guide to Compliance Under the DATA Act*) if population is classified as "small" (See *Exhibit 7* for results).

Exhibit 7: Population/Sampling Parameters (Using File C as Population)

Confidence Level	Population Size	Precision (Range)	Expected Error Rate	Sample Size
95%	10,000*	10%	50%	385*
95%	6,603	10%	50%	379
95%	6,603	10%	40%	365
95%	6,603	10%	30%	323
95%	**6,603**	**10%**	**20%**	**254**
95%	6,603	10%	10%	156

*10,000 transactions would be considered a "large population." Thus, using the statistical software, the sample size results in the recommended/maximum sample size noted per the *Inspectors General Guide to Compliance Under the DATA Act* Guide (385 samples).

APPENDIX B: REQUIRED DATA ELEMENTS FOR FEDERAL AGENCY REPORTING

Data Element	Data Description	Submission File
Appropriations Account	The basic unit of an appropriation generally reflecting each unnumbered paragraph in an appropriation act.	Files A and B
Budget Authority Appropriated	A provision of law (not necessarily in an appropriations act) authorizing an account to incur obligations and to make outlays for a given purpose.	File A and B
Object Class	Categories in a classification system that present obligations by the items or services purchased by the Federal Government.	Files B and C
Obligation	A legally binding agreement that will result in outlays, immediately or in the future.	Files A, B, and C
Other Budgetary Resources	New borrowing authority, contract authority, and spending authority from offsetting collections provided by Congress in an appropriations act or other legislation, or unobligated balances of budgetary resources made available in previous legislation, to incur obligations and to make outlays.	File A and B
Outlay	Payments made to liquidate an obligation (other than the repayment of debt principal or other disbursements that are "means of financing" transactions). Outlays generally are equal to cash disbursements.	Files A and B[a]
Program Activity	A specific activity or project as listed in the program and financing schedules of the annual budget of the United Agency's Government.	Files B[b]
Treasury Account Symbol (TAS) (excluding sub-account)	The account identification codes assigned by the Department of the Treasury (Treasury) to individual appropriation, receipt, or other fund accounts.	File C[c]
Unobligated Balance	The cumulative amount of budget authority that remains available for obligation under law in unexpired accounts at a point in time.	Files A and B
Action Date	The date the action being reported was issued/ signed by the Government or a binding agreement was reached.	Files D1 and D2
Action Type	A technical communication document intended to give assistance to users of a particular system.	Files D1 and D2
Award Description	A brief description of the purpose of the award.	Files D1 and D2
Award Identification (ID) Number	The unique identifier of the specific award being reported (i.e., Federal Award Identification Number	Files C, D1 and D2

Data Element	Data Description	Submission File
	[FAIN]) for financial assistance and Procurement Instrument Identifier (PIID) for procurement.	
Award Modification/ Amendment Number	The identifier of an action being reported that indicates the specific subsequent change to the initial award.	Files D1 and D2
Award Type	Description (and corresponding code) that provides information to distinguish type of contract, grant, or loan and provides the user with more granularity into the method of delivery of the outcomes.	File D1
Business Types	A collection of indicators of different types of recipients based on socio-economic status and organization/business areas.	File D2
Catalog of Federal Domestic Assistance (CFDA) Number	The number assigned to a Federal area of work in the Catalog of Federal Domestic Assistance.	File D2
Catalog of Federal Domestic Assistance (CFDA) Title^	The title of the area of work under which the Federal award was funded in the Catalog of Federal Domestic Assistance.	File D2
North American Industrial Classification System (NAICS) Code	The identifier that represents the NAICS Code assigned to the solicitation and resulting award identifying the industry in which the contract requirements are normally performed.	File D1
North American Industrial Classification System (NAICS) Description	The title associated with the NAICS Code.	File D1
Ordering Period End Date	The date on which no additional orders referring to it (the award) may be placed.	File D1
Parent Award ID Number	The identifier of the procurement award under which the specific award is issued, such as a Federal Supply Schedule.	File D1
Period of Performance Current End Date	The current date on which awardee effort completes or the award is otherwise ended.	Files D1 and D2
Period of Performance Potential End Date	The date on which awardee effort is completed or the award is otherwise ended.	File D1
Period of Performance Start Date	The date on which awardee effort begins or the award is otherwise effective.	Files D1 and D2
Primary Place of Performance Address	The address where the predominant performance of the award will be accomplished. Components include:	Files D1 and D2

Data Element	Data Description	Submission File
	Address Lines 1 and 2, City, County, Agency Code, and ZIP+4 or Postal Code.	
Primary Place of Performance Congressional District^	U.S. congressional district where the predominant performance of the award will be accomplished; derived from the Primary Place of Performance Address.	Files D1 and D2
Primary Place of Performance Country Code	Country code where the predominant performance of the award will be accomplished.	Files D1 and D2
Primary Place of Performance County Name*	Name of the county represented by the county code where the predominant performance of the award will be accomplished.	Files D1 and D2
Record Type	Code indicating whether an action is an individual transaction or aggregated.	File D2
Amount of Award	The cumulative amount obligated by the Federal Government for an award, calculated by USASpending.gov or a successor site.	Files D1 and D2
Current Total Value of Award*	For procurement, the total amount obligated to date on a contract, including the base and exercised options.	File D1
Federal Action Obligation	Amount of Federal Government's obligation, de-obligation, or liability, in dollars, for an award transaction.	Files D1 and D2
Non-Federal Funding Amount	For financial assistance, the amount of the award funded by non-Federal source(s), in dollars.	File D2
Potential Total Value of Award*	For procurement, the total amount that could be obligated on a contract if the base and all options are exercised.	File D1
Awardee/Recipient Legal Entity Name	The name of the awardee or recipient that relates to the unique identifier.	Files D1 and D2
Awardee/Recipient Unique Identifier	The unique identification number for an awardee or recipient; most commonly the nine-digit number assigned by Dun & Bradstreet, referred to as the DUNS® number.	Files D1, D2, E and F
Highly Compensated Officer Name	The first name, middle initial, and last name of an individual identified as one of the five most highly compensated "Executives."	File E
Highly Compensated Officer Total Compensation	The cash and noncash dollar value earned by one of the five most highly compensated "Executives" during the awardee's preceding fiscal year (FY).	File E
Legal Entity Address	The awardee or recipient's legal business address where the office represented by the Unique Entity	Files D1 and D2

Data Element	Data Description	Submission File
	Identifier (as registered in the System for Award Management [SAM]) is located.	
Legal Entity Congressional District^	The congressional district in which the awardee or recipient is located. This is not a required data element for non-U.S. addresses.	Files D1 and D2
Legal Entity Country Code	Code for the country in which the awardee or recipient is located, using the ISO 3166-1 Alpha-3 GENC Profile, and not the codes listed for those territories and possessions of the United States already identified as "states."	Files D1 and D2
Legal Entity Country Name	The name corresponding to the Country Code.	Files D1 and D2
Ultimate Parent Legal Entity Name**	The name of the ultimate parent of the awardee or recipient. Currently, the name is from the global parent DUNS® number.	Files D1, D2 and E
Ultimate Parent Unique Identifier**	The unique identification number for the ultimate parent of an awardee or recipient.	Files D1, D2 and E
Awarding Agency Code	A department or establishment of the Government as used in the Treasury Account Fund Symbol (TAFS).	Files D1 and D2
Awarding Agency Name	The name associated with a department or establishment of the Government as used in the TAFS.	Files D1 and D2
Awarding Office Code	Identifier of the level n organization that awarded, executed or is otherwise responsible for the transaction.	Files D1 and D2
Awarding Office Name^	Name of the level n organization that awarded, executed, or is otherwise responsible for the transaction.	Files D1 and D2
Awarding Sub Tier Agency Code	Identifier of the level 2 organization that awarded, executed, or is otherwise responsible for the transaction.	Files D1 and D2
Awarding Sub Tier Agency Name	Name of the level 2 organization that awarded, executed, or is otherwise responsible for the transaction.	Files D1 and D2
Funding Agency Code	The three-digit CGAC agency code of the department or establishment of the Government that provided the preponderance of the funds for an award and/or individual transactions related to an award.	Files D1 and D2
Funding Agency Name	Name of the department or establishment of the Government that provided the preponderance of the funds for an award and/or individual transactions related to an award.	Files D1 and D2

Data Element	Data Description	Submission File
Funding Office Code	Identifier of the level n organization that provided the preponderance of the funds obligated by this transaction.	Files D1 and D2
Funding Office Name^	Name of the level n organization that provided the preponderance of the funds obligated by this transaction.	Files D1 and D2
Funding Sub Tier Agency Code	Identifier of the level 2 organization that provided the preponderance of the funds obligated by this transaction.	Files D1 and D2
Funding Sub Tier Agency Name	Name of the level 2 organization that provided the preponderance of the funds obligated by this transaction.	Files D1 and D2

*Denotes a Government-wide Treasury Broker data element.
**For FAINs, the data element is only reported on File E (these elements are derived by SAM and were not included within our sampling error rate calculation).
^Denotes an ASP derived data element.
Source: https://max.gov/maxportal/assets/public/offm/DataStandardsFinal.htm

[a] Per Digital Accountability and Transparency Act of 2014 (DATA Act) and Office of Management and Budget (OMB) reporting guidelines, data element is required to be submitted via Files A and B and may also be optionally submitted via File C. The National Science Foundation (referred to as "NSF" in this report) elected to not report this optional data element in File C. Accordingly, Kearney & Company, P.C. (referred to as "Kearney," "we," and "our" in this report) tested this data element within the File A and B submissions.
[b] Per DATA Act and OMB reporting guidelines, data element is required to be submitted via File B and may also be optionally submitted via File C. NSF elected to not report this optional data element in File C. Accordingly, Kearney tested this data element within the File B submission.
[c] The data elements TAS and Appropriations Account are the same. To avoid double-counting, Kearney aligned the appropriation account field to Files A and B and the TAS to File C.

APPENDIX C: DATA ACT INFORMATION FLOW DIAGRAM

Source: Department of the Treasury. Amendments made to the DATA Act information model schema can be found at
https://fedspendingtransparency.github.io/data-model/

APPENDIX D: SUMMARY OF THE NATIONAL SCIENCE FOUNDATION'S DATA ACT RESULTS

FILE C
Procurement Instrument Identifier (PIID) Data Element

Data Element		Total Count Ys	Total Count Ns	Total Count NTs	Total Count NAs	Total
DE 24	Parent Award Identification Number	10	0	0	0	**10**
DE 34	Award Identification Number – PIID	10	0	0	0	**10**
DE 50	Object Class (+D/R Funding Source)	10	0	0	0	**10**
DE 51	Appropriations Account	10	0	0	0	**10**
DE 53	Transaction Obligated Amount	10	0	0	0	**10**
DE 56	Program Activity Name (+Code)	10	0	0	0	**10**

Financial Assistance Identifier Number (FAIN) Data Element

Data Element		Total Count Ys	Total Count Ns	Total Count NAs	Total
DE 34	Award Identification Number – FAIN	244	0	0	**244**
DE 50	Object Class (+ D/R Funding Source)	244	0	0	**244**
DE 51	Appropriations Account	244	0	0	**244**
DE 53	Transaction Obligated Amount	244	0	0	**244**
DE 56	Program Activity Name (+Code)	244	0	0	**244**

Y   Indicates the data element was present and accurately reported as supported by source systems or source documents, as applicable.

N   Indicates the data element was not present or not accurately reported as supported by source systems or source documents, as applicable.

NT   Indicates the data element was not tested because the sample unit should not have been included in file C. These were considered errors for our statistical sample.

NA   Indicates the data element was not applicable to the sample unit. These were not considered errors for our statistical sample.

File D1
Procurement Instrument Identifier (PIID) Data Element

Data Element		Total Count Ys	Total Count Ns	Total Count NTs	Total Count NDs	Total Count NAs	Total
DE 1	Awardee / Recipient Legal Entity Name	10	0	0	0	0	**10**
DE 2	Awardee / Recipient Unique Identifier	10	0	0	0	0	**10**
DE 3	Ultimate Parent Unique Identifier**	10	0	0	0	0	**10**
DE 4	Ultimate Parent Legal Entity Name**	10	0	0	0	0	**10**
DE 5	Legal Entity Address	10	0	0	0	0	**10**
DE 6	Legal Entity Congressional District^	9	1	0	0	0	**10**
DE 7	Legal Entity Country Code	10	0	0	0	0	**10**
DE 8	Legal Entity Country Name	10	0	0	0	0	**10**
DE 11	Amount of Award	10	0	0	0	0	**10**
DE 14	Current Total Value Of Award*	9	1	0	0	0	**10**
DE 15	Potential Total Value Of Award*	9	1	0	0	0	**10**
DE 16	Award Type	10	0	0	0	0	**10**
DE 17	North American Industrial Classification System (NAICS)	10	0	0	0	0	**10**
DE 18	NAICS Description	10	0	0	0	0	**10**
DE 22	Award Description	10	0	0	0	0	**10**
DE 23	Award Modification / Amendment Number	10	0	0	0	0	**10**
DE 24	Parent Award Identification Number	10	0	0	0	0	**10**
DE 25	Action Date	10	0	0	0	0	**10**
DE 26	Period Of Performance Start Date	10	0	0	0	0	**10**
DE 27	Period Of Performance Current End Date	10	0	0	0	0	**10**
DE 28	Period Of Performance Potential End Date	10	0	0	0	0	**10**
DE 29	Ordering Period End Date	10	0	0	0	0	**10**
DE 30	Primary Place of Performance Address	10	0	0	0	0	**10**
DE 31	Primary Place of Performance Congressional District^	10	0	0	0	0	**10**
DE 32	Primary Place Of Performance Country Code	10	0	0	0	0	**10**
DE 34	Award Identification Number – PIID	10	0	0	0	0	**10**
DE 36	Action Type	10	0	0	0	0	**10**
DE 38	Funding Agency Name	10	0	0	0	0	**10**
DE 39	Funding Agency Code	10	0	0	0	0	**10**
DE 40	Funding Sub Tier Agency Name	10	0	0	0	0	**10**
DE 41	Funding Sub Tier Agency Code	10	0	0	0	0	**10**
DE 42	Funding Office Name^	10	0	0	0	0	**10**
DE 43	Funding Office Code	10	0	0	0	0	**10**
DE 44	Awarding Agency Name	10	0	0	0	0	**10**
DE 45	Awarding Agency Code	10	0	0	0	0	**10**

Data Element		Total Count Ys	Total Count Ns	Total Count NTs	Total Count NDs	Total Count NAs	Total
DE 46	**Awarding Sub Tier Agency Name**	10	0	0	0	0	**10**
DE 47	**Awarding Sub Tier Agency Code**	10	0	0	0	0	**10**
DE 48	**Awarding Office Name^**	10	0	0	0	0	**10**
DE 49	**Awarding Office Code**	10	0	0	0	0	**10**

*Denotes a Government-wide Treasury Broker data element.
**For FAINs, the data element is only reported on File E (these elements are derived by SAM and were not included within our sampling error rate calculation).
^Denotes an ASP derived data element.

Y	Indicates the data element was present and accurately traced to the FPDS and source documents, as applicable.
N	Indicates the data element was not present or not accurately traced to the FPDS and source documents, as applicable.
NT	Indicates the data element was not tested because the sample unit was erroneously included in file C. These were considered errors for our statistical sample.
ND	Indicates the data element was not determinable because although the award was correctly included in file C, it was not correctly included in file D1. These were considered errors for our statistical sample.
NA	Indicates the data element was not applicable to the sample unit. These were not considered errors for our statistical sample.

Notes: DE 5 Legal Entity Address includes the sub-elements Legal Entity Address Lines 1-3, Legal Entity City Name, Legal Entity State Code, Legal Entity State Description, and Legal Entity ZIP +4. We did not include Legal Entity State Description in our error rate. During our test work, we noted that this field was not populated for all sample units in file D1. Per the Federal Procurement Database System – Next Generation (FPDS-NG) Data Dictionary, the Legal Entity State Description is derived from the System for Award Management (SAM) unless SAM Exception is selected. The DATA Act broker system did not populate this field in file D1 as was intended.

DE 14 Current Total Value of Award and DE 15 Potential Total Value of Award, were extracted incorrectly from the FPDS-NG by the DATA Act broker system. [The Office of Management and Budget defines the current total value of award data element as the total amount obligated to date on a contract, including the base and exercised options. Potential total value of award is defined as the total amount that could be obligated on a contract, if the base and all options are exercised.] Specifically, data for these data elements are extracted from the following FPDS-NG fields, respectively: (1) base and exercised options value and (2) base and all options value. FPDS-NG has two columns of data entry for these fields labeled "Current" and "Total". The current column contains modification amounts entered into the system by the user. The total column contains cumulative total award values computed by the system based on the modification amounts entered. All procurement modifications included in our sample reported values for these data elements from the corresponding field's current column, or modification amount, rather than the total column, or total award value. The Department of the Treasury's (Treasury) Government-wide DATA Act Program Management Office (PMO) officials confirmed that the DATA Act broker system incorrectly extracted values for these data elements from the current column rather than the total column. A Treasury official stated that the issue will be resolved once related historical data from USASpending.gov are transferred to beta.USASpending.gov during Fall 2017. However, as the agency does not have responsibility for how data is extracted by the DATA Act broker system, we did not evaluate the reasonableness of Treasury's planned corrective action. We did evaluate DE 14 Current Total Value Of Award and DE 15 Potential Total Value of Award based on the current value and not the calculated total value. Therefore, if the correct current column value was included in DE 14 Current Total Value Of Award and DE 15 Potential Total Value of Award, then we did not consider those to be errors when calculating our error rate.

DE 16 Award Type includes the sub-elements Type of Contract Pricing, IDV_Type, and Contract Award Type. We did not include IDV_Type in our error rate, as errors noted were due to the DATA Act broker system extracting the wrong field. Treasury's DATA Act PMO officials confirmed that they are aware of this issue and have taken steps to avoid this issue in future reporting periods. However, as the agency does not have responsibility for how data is extracted by the broker system, we did not evaluate the reasonableness of Treasury's planned corrective action.

File D2
Financial Assistance Identifier Number (FAIN) Data Element

	Data Element	Total Count Ys	Total Count Ns	Total Count NDs	Total Count NAs	Total
DE 1	Awardee Or Recipient Legal Entity Name	244	0	0	0	**244**
DE 2	Awardee Or Recipient Unique Identifier	244	0	0	0	**244**
DE 5	Legal Entity Address	188	56	0	0	**244**
DE 6	Legal Entity Congressional District^	237	7	0	0	**244**
DE 7	Legal Entity Country Code	244	0	0	0	**244**
DE 11	Federal Action Obligation	240	4	0	0	**244**
DE 12	Non-Federal Funding Amount	244	0	0	0	**244**
DE 13	Total Funding Amount	244	0	0	0	**244**
DE 14	Face Value Loan Guarantee	244	0	0	0	**244**
DE 16	Assistance Type	216	28	0	0	**244**
DE 19	Catalog of Federal Domestic Assistance (CFDA) Number	244	0	0	0	**244**
DE 20	CFDA Title^	243	1	0	0	**244**
DE 22	Award Description	244	0	0	0	**244**
DE 23	Award Modification / Amendment Number	244	0	0	0	**244**
DE 25	Action Date	243	1	0	0	**244**
DE 26	Period Of Performance Start Date	244	0	0	0	**244**
DE 27	Period Of Performance Current End Date	244	0	0	0	**244**
DE 30	Primary Place of Performance Address	210	34	0	0	**244**
DE 31	Primary Place Of Performance Congressional District^	237	7	0	0	**244**
DE 32	Primary Place Of Performance Country Code	244	0	0	0	**244**
DE 34	Award Identification Number – FAIN	244	0	0	0	**244**
DE 35	Record Type	244	0	0	0	**244**
DE 36	Action Type	244	0	0	0	**244**
DE 37	Business Types	243	1	0	0	**244**
DE 38	Funding Agency Name	244	0	0	0	**244**
DE 39	Funding Agency Code	244	0	0	0	**244**
DE 40	Funding Sub Tier Agency Name	244	0	0	0	**244**
DE 41	Funding Sub Tier Agency Code	244	0	0	0	**244**
DE 42	Funding Office Name^	93	151	0	0	**244**
DE 43	Funding Office Code	242	2	0	0	**244**
DE 44	Awarding Agency Name	244	0	0	0	**244**
DE 45	Awarding Agency Code	244	0	0	0	**244**
DE 46	Awarding Sub Tier Agency Name	244	0	0	0	**244**
DE 47	Awarding Sub Tier Agency Code	244	0	0	0	**244**
DE 48	Awarding Office Name^	93	151	0	0	**244**
DE 49	Awarding Office Code	244	0	0	0	**244**

*Denotes a Government-wide Treasury Broker data element.

**For FAINs, the data element is only reported on File E (these elements are derived by SAM and were not included within our sampling error rate calculation).
^Denotes an ASP derived data element.

Y	Indicates the data element was present and accurately traced to ASP, SAM, and source documents, as applicable.
N	Indicates the data element was not present or not accurately traced to ASP, SAM, and source documents, as applicable.
ND	Indicates the data element was not determinable because although the award was correctly included in file C, it was not correctly included in file D2. These were considered errors for our statistical sample.
NA	Indicates the data element was not applicable to the sample unit. These were not considered errors for our statistical sample.

Notes: DE 5 Legal Entity Address includes sub-elements Legal Entity Address Lines 1-3, Legal Entity City Name, Legal Entity City Code, Legal Entity Foreign City Name, Legal Entity State Code, Legal Entity State Name, Legal Entity Foreign Province Name, Legal Entity ZIP 5, Legal Entity ZIP Last 4, Legal Entity Foreign Postal Code, Legal Entity County Name, and Legal Entity County Code. We did not include Legal Entity City Code in our error rate. During our test work, we noted that this field was not populated for all sample units in file D2. Per the DATA Act Information Model Schema (DAIMS), the Legal Entity City Code is derived from Award Submission Portal (ASP). The DATA Act broker system did not populate this field in file D2 as was intended. However, as the agency does not have responsibility for how data is extracted by the DATA Act broker system from Treasury's ASP, we did not evaluate the reasonableness of Treasury's planned corrective action.

DE 30 Primary Place of Performance Address includes sub-elements Primary Place of Performance City Name, Primary Place of Performance State Name, Primary Place of Performance County Name, Primary Place of Performance ZIP +4, and Primary Place of Performance Code. We did not include Primary Place of Performance County Name in our error rate. During our test work, we noted that this field was not populated for all sample units in file D2. Per the DAIMS, the Primary Place of Performance County Name is derived from ASP. The DATA Act broker system did not populate this field in file D2 as was intended. However, as the agency does not have responsibility for how data is extracted by the DATA Act broker from Treasury's ASP, we did not evaluate the reasonableness of Treasury's planned corrective action.

APPENDIX E: MANAGEMENT'S RESPONSE

OFFICE OF BUDGET, FINANCE & AWARD MANAGEMENT

M E M O R A N D U M

DATE: November 15, 2017

TO: Allison Lerner, Inspector General

FROM: Teresa Grancorvitz, DATA Act Senior Accountable Official,
Acting Chief Financial Officer and Office Head, Budget, Finance and
Award Management (BFA)

SUBJECT: Management's Response to Official Draft Report, Audit of NSF's
Implementation of the DATA Act

Thank you for the opportunity to respond to the official draft report dated November 8,
2017, "Audit of the National Science Foundation's Implementation of the Digital
Accountability and Transparency Act of 2014 (DATA Act)." This performance audit and
NSF's response represents the first time agency data have been reviewed under the
DATA Act and is reflective not only of an unprecedented government-wide collaborative
implementation effort, but also of evolving guidance, submission and audit standards that
will continue to mature as the DATA Act progresses.

The National Science Foundation (NSF) is committed to the DATA Act's goals of
improving financial data transparency and reducing administrative burden. Since the
DATA Act was enacted in 2014, NSF has worked collaboratively with OMB and
Treasury, first to develop data standards in May 2015, and then to report against these
new standards, taking an agile, iterative, data centered approach to building new digital
tools to collect and display this data publicly. NSF was a dedicated community partner,
earning the Treasury Secretary's Certificate of Appreciation for outstanding commitment
to collaboration in working to achieve transparency and accountability.

We appreciate the auditors' approach in separating Government-wide reporting errors
that are beyond NSF's control from errors they found attributable to the agency.
Nonetheless, NSF has identified three areas of differences with the auditors' report.

First, we differ with the auditors with respect to a substantial percentage of the NSF-
attributed errors, because we were aware of these transactions and documented them as
legitimate in accordance with OMB guidance. Taking this and other minor differences of
opinion into account, NSF can state that its submission substantially complies with all
required data elements and presents NSF data in all material respects, meeting the
transparency goals of the DATA Act.

1

Second, we do not agree with the underlying methodology used to calculate the error rates. NSF maintains that the error rates for accuracy, completeness and timeliness would more appropriately be calculated by reviewing each data element rather than at the transaction level, as was performed in this audit. OMB acknowledges that its 2010 guidance defining completeness and accuracy error rates at the transaction level may need to be updated to be relevant to the DATA Act. Indeed, the auditors' own tables set forth in Appendix D of their report confirm that analyzing NSF's submission on a per element basis would result in dramatically lower error rates.

Finally, while we generally agree with each of the auditors' recommendations, we do not agree with the causes and their linkage to the effects stated in the report, which led to the auditors' findings. We believe that NSF has sufficient reconciliation and quality control procedures embedded into our data submission processes to ensure that information is accurate, complete and timely, meeting the transparency goals of the DATA Act. Where we found errors, NSF took immediate steps to identify their source, resolving those within NSF control so they would not affect subsequent submissions.[1] Specifically, NSF detected and fixed a few defects in NSF code early on. Other errors cited as contributing to the auditors' findings were due to NSF proactively submitting optional fields which Treasury was unable to process. The cause of the remaining auditor-identified errors is due to differences between the auditors and NSF management in the interpretation of OMB guidance and of NSF business practices.

NSF's specific analysis of the error rate and responses to your recommendations are included in the attachment to this memo. I appreciate the hard work of NSF staff and their commitment to collaborating around DATA Act stewardship with your audit contractor, Kearney & Company (Kearney) to support their work. I also want to thank Kearney and your staff for their collaboration, professionalism and willingness to engage with my staff during the course of this audit. This was particularly important given the government-wide limitations on our data and given that DATA Act guidance and audit standards are still maturing.

NSF, together with OMB and Treasury, will carefully review and consider both agency-specific and government-wide findings on the DATA Act implementation based on the reporting standards and processes established. If you have any questions, please do not hesitate to contact me at (703) 292-4435 or Charisse Carney-Nunes at (703) 292-5056.

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[1] Government-wide issues were referred to OMB and Treasury.

2

Attachment

NSF Analysis of Error Rate and Response to Audit Recommendations

Error Rate Analysis: In addition to our disagreement with the use of the transaction-based methodology, we believe that NSF's error rates for accuracy and completeness are inappropriately elevated. For example, 28 of 28 Award Type accuracy errors could have been eliminated using agency-provided information because the data reported in File D2 is consistent with NSF's award management system. Removing NSF errors that should have been verified as valid would reduce the NSF accuracy error rate from 43.3% to approximately 25%.

Similarly, NSF's completion error rate would be reduced from 41.7% to approximately 2% by removing errors that were 1) actually transactions that NSF had documented as legitimate in accordance with OMB guidance and 2) errors that are not attributable to NSF. Approximately 76% of NSF completeness errors were due to accounting adjustments consistent with the agency's standard business practices. In addition, a known Treasury issue with the SAM Zip Code+4 contributed to approximately 10% of NSF completeness errors.

Recommendation 1: Kearney recommends that NSF develop and implement procedures to validate the accuracy of the data reported to the FPDS-NG and ASP, including procedures to ensure the accuracy of data entered into NSF-owned systems, which interface with the Federal Procurement Data System – Next Generation (FPDS-NG) and the Award Submission Portal (ASP).

Response:
NSF generally agrees with this recommendation. NSF has reconciliation and quality control procedures embedded into our data submission processes to validate the accuracy of its ASP and FPDS-NG data, and is always looking for opportunities for improvement.

NSF has a robust validation process for the monthly ASP data file which is validated by the Division of Institution and Award Support of NSF's Office of Budget, Finance and Award Management (BFA) to ensure the ASP data is a true reflection of the award activity from the award management system for the reporting period. Additionally, BFA's Budget Division validates the award activity ASP data for the reporting period ties with financial system activity. Findings are logged and tracked for subsequent actions.

NSF's contract writing system, the Automated Acquisition Management System (AAMS), is tightly integrated with FPDS-NG so all the contract actions are reflected in the FPDS-NG system. The Division of Acquisition and Cooperative Support (DACS) in BFA has an existing process in place to ensure accuracy of the data in accordance with the Federal Acquisition Regulation (FAR) 4.604 and NSF Acquisition Manual 2504.606-70(d).

3

Recommendation 2: Kearney recommends that NSF perform an assessment over the linkage between Files C to D1/D2 to ensure compliance with DATA Act requirements and standards. NSF should implement controls to confirm the completeness of data entered into NSF-owned systems (iTRAK and Awards) which is submitted to FPDS-NG and ASP on a periodic basis.

Response:
NSF generally agrees with the recommendation to perform an assessment over the linkage between Files C to D1/D2 and believes that current agency processes are responsive to it. The only common elements between files C and D1/D2 are the PIID/FAIN and the transaction amount. To date, agency assessments have demonstrated that these files are appropriately linked in accordance with applicable guidance. As documented in the DATA Act Standard Operating Procedures, NSF performs pre-Broker submission validations before leveraging the broker. Using these processes, NSF performs comparisons between these elements multiple times as intended by Treasury before the quarter-end submission to catch early errors and sufficiently address data quality issues.

While differences do exist, these differences are predominately due to standard business practices and are therefore legitimate. OMB guidance set forth in M-17-04 recognizes that DATA Act files may have legitimate differences, and NSF has provided explanations for any misalignment.

In particular, NSF notes that file C is a true reflection of the accounting activity in iTRAK and file D2 is a true reflection of the award activity in Awards Management System. A majority (approximately 76%) of the C/D2 Broker warnings are due to accounting adjustments after an award is financially closed in iTRAK. NSF's business practice allows an awardee to retain access to the obligated funds for up to 15 months after the award is financially closed for any additional expenditures, and an awardee may always return funds to NSF. Such adjustments are only recorded in iTRAK and not in the Awards Management System as these are not true award actions from an Awards Management System perspective. NSF's Awards Management System is not an accounting ledger and so does not record these adjustments which are appropriately recorded in NSF's financial system of record. Hence, these Broker warnings are accepted by NSF's DATA Act Senior Accountable Official (SAO) during the DATA Act quarterly submission and certification process in accordance with DATA Act standards.

Additionally, the award closeout process was reviewed as part of a U.S. Government Accountability Office (GAO) report, Actions Needed to Address Persistent Grant Closeout Timeliness and Undisbursed Balance Issues, GAO-16-362: Published: April 14, 2016 and an earlier April 2012 GAO report, GAO-12-360, Grants Management: Action Needed to Improve the Timeliness of Grant Closeouts by Federal Agencies. The GAO had no recommendations for the NSF in terms of our closeout process, and NSF has no plans to change it.

4

At present, the agency is in compliance with the DATA Act requirements and standards and plans to continue its standard business practices and processes. NSF will continue to assess DATA Act file linkages, and seek out opportunities to continuously improve transparency.

Recommendation 3: Kearney recommends that NSF develop and implement a process (i.e., perform reconciliations) to enter procurement transactions into the Government-wide FPDS-NG within 30 days of the end of the quarter.

Response: NSF generally agrees that a process to perform reconciliation in this area is a necessary requirement, and points out that the agency has procedures in place in the form of the monthly Procurement (P) File for award attribute population in the financial system, which is developed and reviewed by Policy Team members from DACS in BFA. With respect to entering a procurement transaction into FPDS-NG within 30 days of the end of the quarter, FFAR 4.604(b)(2) already requires procurement transactions to be completed in FPDS-NG within 3 business days after contract award. NSF's policy implementing this FAR requirement is set forth in the agency's Acquisition Manual and is even more stringent, requiring NSF Contracting Officers to "ensure that a required FPDS-NG report has been approved/finalized at the time award is made in AAMS, unless a confirmed system issue exists preventing FPDS-NG approval/finalization."

Recommendation 4: Kearney recommends that NSF expand and improve upon existing internal quality control procedures to confirm the accuracy and integrity of the data prior to submission to allow the SAO to appropriately certify all data included in files.

Response: NSF generally agrees with this recommendation. The agency has internal quality control procedures in place to confirm the accuracy and integrity of the data prior to submission, and we are always looking for opportunities for continuous improvement.

5

APPENDIX F: KEARNEY'S RESPONSE

Kearney & Company, P.C. (referred to as "Kearney," "we," and "our" in this document) appreciates NSF's management's thorough response to the draft DATA Act report. NSF generally concurred with our recommendations and we commend NSF for its commitment and responsiveness during the DATA Act Audit, specifically during the testing and reporting phases.

The purpose and objective of the DATA Act is to make agency data "easier to understand how the Federal government spends taxpayer dollars but will also serve as a tool for better oversight, data-centric decision-making, and innovation both inside and outside of government."[33] Ultimately, the goal of the DATA Act is to allow the general public to understand individual agency's spending data. The intent of our DATA Act audit was to determine whether NSF's reported data, (Fiscal Year 2017 Quarter 2) complied with Government-wide financial data standards developed and issued by OMB and Treasury.

NSF disagrees with our methodology regarding how the sampling error rates were calculated. NSF stated, "...error rates for accuracy, completeness and timeliness would more appropriately be calculated by reviewing each data element rather than at the transaction level." Kearney generally concurs that reporting sampling error rates by data element would provide further insight over NSF's overall error rate; however, we were required to report our sampling errors rates by transaction in accordance with OMB guidance. Further, we included additional tables within our report that detailed our testing results by data element. Additionally, we also noted whether errors we identified were attributable to NSF's reporting or to Government-wide reporting issues outside of NSF's control. Although we reported our sampling error calculations at the transaction level, we believe the additional tables and information presented in the report provide further information and transparency regarding our testing results.

NSF does not agree with our conclusion that insufficient reconciliations are the cause of the errors we identified. NSF stated it has "sufficient reconciliation and quality control procedures embedded into our data submission processes to ensure that information is accurate, complete and timely, meeting the transparency goals of the DATA Act." While we understand and acknowledge that NSF has reconciliation procedures in place that enabled it to identify errors as part of the Broker Warning/Errors reports, we noted that NSF did not have complete reconciliations, which provide "linkage" between the File C to File D1/D2 submissions.

As a result, we noted several discrepancies associated with data elements during our testing. An individual from the general public would be unable to understand and conclude that data reporting discrepancies arise from NSF's specific and unique business practices, thus reducing the reliability and usefulness of the data. The aim of the DATA Act is to "to increase accountability, transparency, accessibility, quality, and standardization in Federal spending data." NSF's reported spending data displays completeness issues within NSF's financial and awards systems.

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[33] https://www.usaspending.gov/Pages/data-act.aspx

APPENDIX G: ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ASP	Award Submission Portal
Broker	DATA Act Broker
CFDA	Catalog of Federal Domestic Assistance
CIGIE	Counsel of Inspectors General on Integrity and Efficiency
DAIMS	DATA Act Information Model Schema, v.1.1
DATA Act	Digital Accountability and Transparency Act of 2014
DACS	Division of Acquisition and Cooperative Support
DFM	Division of Financial Management
DIAS	Division of Institution and Award Support
DIS	Division of Information Systems
FAIN	Federal Award Identification Number
FFATA	Federal Funding Accountability and Transparency Act of 2006
FISCAM	Federal Information System Controls Audit Manual
FPDS-NG	Federal Procurement Data System – Next Generation
FSRS	FFATA Sub-award Reporting System
FY	Fiscal Year
GAO	Government Accountability Office
GTAS	Governmentwide Treasury Account Symbol Adjusted Trial Balance System
ID	Identification
IDD	Interface Definition Document
IDV	Indefinite Delivery Vehicle
Kearney	Kearney & Company, P.C.
NAICS	North American Industrial Classification System
NANP	North American Numbering Plan
OGC	Office of General Counsel
OIG	Office of Inspector General
OMB	Office of Management and Budget
PIID	Procurement Instrument Identifier
PoP	Period of Performance
Q	Quarter
SAM	System of Award Management
SAO	Senior Accountable Official
SBR	Statement of Budgetary Resources
SF	Standard Form
SOW	Statement of Work
TAFS	Treasury Account Fund Symbol
TAS	Treasury Account Symbol
Treasury	Department of the Treasury