

Fiscal Year 2019 Implementation of the Digital Accountability and Transparency Act of 2014 Performance Audit

REPORT PREPARED BY KEARNEY & COMPANY, P.C.

NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL

November 8, 2019
OIG 20-2-003





AT A GLANCE

Fiscal Year 2019 Implementation of the *Digital Accountability and Transparency Act of 2014*
Performance Audit
Report No. OIG 20-2-003
November 8, 2019

AUDIT OBJECTIVE

The National Science Foundation Office of Inspector General engaged Kearney & Company, P.C. (Kearney) to conduct a performance audit of the National Science Foundation's fiscal year 2019 first quarter spending data submitted under the *Digital Accountability and Transparency Act of 2014* (DATA Act). The objectives of the audit were to assess the completeness, accuracy, timeliness, and quality of the financial and award data reported to the public through [USAspending.gov](https://www.usaspending.gov) and to assess NSF's implementation and use of the Government-wide financial data standards.

AUDIT RESULTS

Kearney concluded that NSF took steps to implement and use the Government-wide financial data standards but identified concerns regarding the completeness, accuracy, timeliness, and quality of NSF's spending data. Specifically, Kearney found that NSF's submission contained record-level data linkage errors between NSF's financial and award files, and incomplete, inaccurate, and/or untimely information derived from the System of Award Management (SAM). Kearney identified errors in approximately 58 percent of transactions tested. Within this group, Kearney identified that approximately 8 percent of errors were attributable to non-NSF maintained data. The majority of discrepancies were File C transactions not reported in File D2, and resulted from NSF's interpretation of DATA Act reporting guidance which differed from Kearney and the OIG's interpretation. These issues hinder the agency's ability to provide reliable and high-quality data, achieve full transparency to the public, and comply with Federal accountability requirements. Kearney is responsible for the attached report and the conclusions expressed in this report. NSF OIG does not express any opinion on the conclusions presented in Kearney's audit report.

RECOMMENDATIONS

The auditors included three findings in the report with associated recommendations aimed at improving internal control and business processes to ensure that NSF provides reliable spending data in [USAspending.gov](https://www.usaspending.gov).

MANAGEMENT'S RESPONSE

NSF partially concurred with the recommendations, agreeing to continued collaboration with OIG and Kearney to seek resolution regarding NSF's methodology for evaluating variances between File C and File D2, improving its procedures for reconciling data between File C and File D1, and exploring opportunities to strengthen the validation process for SAM-derived data. NSF's response is included in its entirety as Appendix E. Kearney's rebuttal to NSF's response is included in its entirety at Appendix F.

FOR FURTHER INFORMATION, CONTACT US AT OIGPUBLICAFFAIRS@NSF.GOV.



National Science Foundation • Office of Inspector General
2415 Eisenhower Avenue, Alexandria, Virginia 22314

MEMORANDUM

DATE: November 8, 2019

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

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

FROM: Mark Bell [REDACTED]
Assistant Inspector General
Office of Audits

SUBJECT: Audit Report No. 20-2-003, Fiscal Year 2019 Implementation of the *Digital Accountability and Transparency Act of 2014* Performance Audit

This memorandum transmits the Kearney & Company, P.C. (Kearney) report for the audit of NSF's Fiscal Year (FY) 2019 implementation of the *Digital Accountability and Transparency Act of 2014* (DATA Act). The objectives of the audit were to assess the completeness, accuracy, timeliness, and quality of NSF's FY 2019 first quarter spending data submitted through USAspending.gov in accordance with the DATA Act, and to assess NSF's implementation and use of the Government-wide financial data standards established by the Office of Management and Budget (OMB) and the U.S. Department of Treasury (Treasury).

Please coordinate with our office during the 6-month resolution period, as specified by OMB Circular A-50, to develop a mutually agreeable resolution of the audit findings. The findings should not be closed until NSF determines that all recommendations have been adequately addressed and the proposed corrective actions have been satisfactorily implemented.

OIG Oversight of Audit

Kearney is responsible for the attached auditors' report and the conclusions expressed in this report. We do not express any opinion on the conclusions presented in Kearney's audit report. To fulfill our responsibilities, we:

- reviewed Kearney’s approach and planning of the audit;
- evaluated the qualifications and independence of the auditors;
- monitored the progress of the audit at key points;
- coordinated periodic meetings with Kearney, as necessary, to discuss audit progress, findings, and recommendations;
- reviewed the audit report prepared by Kearney; and
- coordinated issuance of the audit report.

We thank your staff for the assistance that was extended to the auditors during this audit. If you have any questions regarding this report, please contact Laura Rainey at 703.292.7100 or OIGpublicaffairs@nsf.gov.

Attachment

cc:

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**National Science Foundation
Office of Inspector General**

**Fiscal Year 2019 Implementation of the Digital
Accountability and Transparency Act of 2014 (DATA
Act) Performance Audit**

Performance Audit Report

November 8, 2019



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Kearney & Company, P.C.'s TIN is 54-1603527, DUNS is 18-657-6310, Cage Code is 1SJ14

Dr. France A. Córdoba
Director
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2415 Eisenhower Avenue
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Ms. Teresa Grancorvitz
Chief Financial Officer and Office Head, Office of Budget, Finance, and Award Management
and Senior Accountable Official
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 for First Quarter Fiscal Year 2019 Spending Data

Dear Dr. Córdoba 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**.

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 8, 2019

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EXECUTIVE SUMMARY

The Office of Inspector General (OIG) engaged Kearney & Company, P.C. (referred to as “Kearney,” “we,” and “our” in this report) to conduct a performance audit over NSF’s first quarter (Q1) fiscal year (FY) 2019 spending data submitted under the Digital Accountability and Transparency Act of 2014¹ (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 objectives of our performance audit were to review a statistically valid sample of NSF’s Q1 FY 2019 spending data, to assess the accuracy, completeness, timeliness, and quality of the data sampled, and to assess NSF’s implementation and use of the Government-wide data standards.

Kearney reviewed a statistically valid sample of spending data that NSF submitted in Q1 FY 2019 under the DATA Act. We found that NSF submitted its Q1 FY 2019 data timely and File C (Financial) was suitable for testing; however, there were discrepancies within certain submission files. Specifically, the submission contained three issues: Incomplete Record-Level Linkage from File C to File D2 (Award – Financial Assistance), Incomplete Record-Level Linkage from File C to File D1 (Award – Procurement), and Inaccurate Reporting of Data Elements within the System for Award Management (SAM or SAM.gov). The majority of discrepancies were File C transactions not reported in File D2. They resulted from NSF’s interpretation of DATA Act reporting guidance which differed from Kearney and the OIG’s interpretation. These discrepancies extended across all data elements resulting in a determination of low data quality.

NSF reported 4,467 detail award transactions (i.e., records or rows) in its File C submission. The statistical sample included 355 detail award transactions (350 Federal Award Identification Number [FAIN] and 5 Procurement Instrument Identifier [PIID]) selected from File C. Of the 355 samples, 229 transactions contained completeness, accuracy, and/or timeliness errors in one or more data elements and did not meet the quality requirements as outlined by OMB. Of the 229 transactions, 226 transactions contained errors due to Incomplete Record-Level Linkage from File C (Financial) to File D2 (Award – Financial Assistance). There were a total of 13,707 data elements associated with 355 transactions tested. Of the 13,707 applicable data elements, 8,366 (57.5%) contained completeness issues, 8,371 (57.5%) contained accuracy issues, and 8,406 (57.7%) contained timeliness issues. Within this group a share of errors were attributable to non-NSF maintained data. We determined 2,940 of the 8,366 (7.7%) incomplete data elements, 2,945 of the 8,371 (7.7%) inaccurate data elements, and 2,953 of the 8,406 (7.7%) untimely data elements were not specifically attributable to NSF².

If the data remains uncorrected, there is a risk that incomplete or inaccurate data will be uploaded to USAspending.gov, decreasing the reliability of the data. Although, NSF took many steps to implement and use data standards required by Federal guidance, improvements are still

¹ Public Law (P.L.) No. 113-101

² We noted that our sampling error rate is determined based on a projection of the total sampling errors. The error rate is calculated based on the average percentage of data elements noted as incomplete, inaccurate, and untimely per sampled transaction (e.g., if a record noted 41 applicable data elements, and 37 of the data elements were incomplete for one transaction, this would result in a 90% error rate).

needed. As a result of this audit, 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. We included NSF's response in its entirety in **Appendix E**.

OBJECTIVE

The objectives of this performance audit were to assess the completeness, accuracy, timeliness, and quality of NSF's FY 2019 Q1 financial and award data submitted for publication on USAspending.gov in accordance with the DATA Act and to assess NSF's implementation and use of the Government-wide financial data standards established by OMB and Treasury.

BACKGROUND

In 2018, the Federal Government expended more than \$4 trillion in payments to vendors, contractors, and grantees, in the form of contracts, grants, loans, and other financial awards.³ To increase the transparency of and accountability for that spending, Congress passed the Federal Funding Accountability and Transparency Act (FFATA) in 2006.⁴ The act, as amended by the Government Funding Transparency Act of 2008,⁵ requires the 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 website USAspending.gov.

The DATA Act was signed into law in May 2014 to expand the reporting requirements pursuant to FFATA. The purpose of the DATA Act is to disclose "direct Federal agency expenditures"⁶ and "track Federal spending."⁷ The DATA Act requires Federal agencies to report financial and award data to the public through USAspending.gov in accordance with the established Government-wide financial data standards (developed and issued by OMB and Treasury).

Guidance Related to Federal Agency Accountability and Transparency

OMB has published several sources of implementation guidance relating to FFATA and the DATA Act in order 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 DATA Act Broker (Broker).⁸ Some notable sources of guidance available to agencies include:

³ Department of the Treasury, <https://beta.USAspending.gov/#/> (accessed on September 15, 2019). This amount includes total spending awarded to individuals, private contractors, and local governments, and excludes the cost of running the Government and direct services (that is, non-award spending, or money that was not given out through contracts, grants, direct payments, loans, or insurance).

⁴ P.L. No. 109-282

⁵ P.L. No. 110-252

⁶ P.L. No. 109-282

⁷ P.L. No. 113-101

⁸ The Broker is an automated system developed by Treasury to facilitate the submission of data for the DATA Act.

- 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 published, Government information. The *Open Government Directive – Federal Spending Transparency* and the *Open Government Directive – Framework for the Quality of Federal Spending Information*, gives guidance to Federal agencies in implementing the requirements in OMB-M-10-06
- OMB M-18-16, *Appendix A to OMB Circular No. A-123, Management of Reporting and Data Integrity Risk*, offers Federal agencies the flexibility to determine which control activities are necessary to achieve reasonable assurance over internal controls and processes that support overall data quality contained in agency reports. This includes a requirement that agencies implement a Data Quality Plan (DQP), which is effective FY 2019 through FY 2021, at a minimum
- OMB Management Procedures Memorandum No. 2016-03, *Additional Guidance for DATA Act Implementation: Implementing Data-Centric Approach for Reporting Federal Spending Information*, provides 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 provides specific technical assistance on certain matters (e.g., awards involving intra-governmental transfers and quarterly Senior Accountable Official [SAO] assurances)
- DATA Act Information Model Schema (DAIMS), Version (v).1.3, issued by Treasury on June 29, 2018, is the authoritative source for the terms, definitions, formats and structures of the data elements. DAIMS provides requirements for Federal agencies on reporting to the Broker
- Federal Spending Transparency Data Standards, in accordance with the DATA Act, issued by OMB and Treasury, established the set of Government-wide data standards⁹ for Federal funds made available to or expended by Federal agencies. Agencies were required to report financial data in accordance with these standards beginning in FY 2017 second quarter (Q2).

The DATA Act also requires each Federal agency’s OIG to audit a statistically valid sample of the spending data submitted by its Federal agency; assess the completeness, accuracy, and timeliness, and overall quality of the data sampled; and assess the agency’s implementation and use of Government-wide financial data standards. The OIGs are required to submit to Congress and make publicly available a report of the results of the assessment.¹⁰

⁹ The 57 standard data elements, including their definitions are in **Appendix B** of this report. They are also available at <http://portal.max.gov/portal/assets/public/offm/DataStandardsFinal.htm> (accessed on May 13, 2019).

¹⁰ 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-19-004, October 2018), see Appendix A of this report. For the CIGIE Guide, please see:

To meet the needs of the Inspector General (IG) community, the Council of the Inspectors General on Integrity and Efficiency's (CIGIE) Federal Audit Executive Council (FAEC) established the DATA Act Working Group. In consultation with the Government Accountability Office (GAO), as required by the DATA Act, the Working Group developed the *CIGIE FAEC Inspectors General Guide to Compliance under the DATA Act* (Guide), which presents a common methodology and reporting approach for the IG community to use in performing its mandated work.

DATA Act Reporting Date Anomaly

CIGIE identified a timing anomaly with the oversight requirements contained in the DATA Act. That is, the first IG reports were due to Congress in November 2016; however, Federal agencies were not required to report spending data until May 2017. To address this reporting date anomaly, the IGs provided Congress with their first required reports by November 8, 2017, one year after the statutory due date, with two subsequent reports to be submitted following on a two-year cycle. On December 22, 2015, CIGIE's chair issued a letter detailing the strategy for dealing with the IG reporting date anomaly and communicated the strategy to the Senate Committee on Homeland Security and Governmental Affairs and the House Committee on Oversight and Government Reform. Please see the referenced letter at **Appendix H**.

DATA Act Submission

The DATA Act requires Federal agencies to submit Q1 data through USAspending.gov on or before March 20, 2019¹¹. Treasury developed an information technology (IT) system, the Broker, to facilitate the submission of data for the DATA Act. Agencies are required to use the Broker¹² to upload three files containing data from the agencies' 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 then certifies the agency's data in the Broker.

Files Generated Utilizing Agency Information Systems

Exhibit 1 details the three files Federal agencies generate from internal information systems and records.

<https://www.ignet.gov/sites/default/files/files/CIGIE-FAEC-FY2019-IG-Guide-to-Compliance-under-the-DATA-Act.pdf>

¹¹ Due to the Government shutdown furlough between December 22, 2018 and January 25, 2019, the due date for agency submissions for FY 2019, Q1 data was extended to March 20, 2019.

¹² OMB Management Procedures Memorandum (MPM) 2016-03, Additional Guidance for DATA Act Implementation: Implementing Data-Centric Approach for Reporting Federal Spending, requires agencies to submit data required by DATA Act directly to Treasury. Treasury issued DAIMS v.1.3 directing agencies to complete the submission through the Broker.

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. Six of the 57 required data elements are included in File A, including the amount appropriated ¹³ and obligated ¹⁴ during the FY. The information in File A is reported for each Treasury Account Symbol (TAS). ¹⁵ File A data is reported at the summary level, rather than the individual transaction level.
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 ¹⁶ and object class, ¹⁷ which represent an additional two required data elements. Similar to File A, File B data is not reported at the 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. Four of the 57 required data elements are included in File C, including the TAS used to fund the award, the amount of the award or modification, and a unique identifier. 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.

Files Generated in the Broker

Exhibit 2 details the four files that are part of the DATA Act submission files but are not populated directly by the Federal agencies’ internal systems. Instead, the Broker generates these files from data submitted by Federal agencies. Although the agencies do not directly create the files, the agency SAOs must still provide assurance over the quality of the data.

Exhibit 2: 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 Q1 of FY 2019. File D1 includes 41 of the required data elements, including a unique identifier, a description of the award, the place of performance, and the period of performance. Records can be traced from File D1 to File C using the unique identifier.

¹³ An appropriation is the provision of funds, through an annual appropriations act or a permanent law, for federal agencies to make payments out of the Treasury for specified purposes.

¹⁴ Obligations are definite commitments that create a legal liability of the Government for payment.

¹⁵ 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 spend in accordance with law.

¹⁶ A program activity is a specific activity or project as listed in the program and financing schedules of the annual budget of the United States Government.

¹⁷ According to the DATA Act, object class, “...means the category assigned for purposes of the annual budget of the President submitted under section 1105(a) of title 31, United States Code, to the type of property or services purchased by the Federal Government.” 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 in OMB Circular No. A-11, Preparation, Submission, and Execution of the Budget.

DATA Act Submission File	File Description
	<p>When agencies generate File D1 in the Broker, the Broker pulls the information from the Federal Procurement Data System – Next Generation (FPDS-NG).¹⁸ The General Services Administration (GSA) operates FPDS-NG and the Federal Government uses it to collect and report on procurement spending across all Federal agencies.¹⁹ Agencies are required to report all contracts with an estimated value over \$10,000 and modifications to those contracts into FPDS-NG.</p>
File D2– Award and Awardee Attributes (Financial Assistance)	<p>File D2 includes transaction-level information for all financial awards processed during Q1 of FY 2019. File D2 comprises 38 of the 57 required data elements, including a unique identifier, the legal name of the awardee, the place of performance, and the period of performance. Records can be traced from File D2 to File C using the unique record identifier (URI).</p> <p>When agencies generate File D2 in the Broker, the Broker pulls the information from the Financial Assistance Broker Submission (FABS) for all awards reported during Q1. Treasury operates FABS, which is part of USAspending.gov. On a monthly basis, agencies are required to report all financial assistance awards of \$25,000 or more to the FABS.</p>
File E – Additional Awardee Attributes	<p>File E includes information on organizations that received procurement or financial assistance awards during Q1 of FY 2019. In total, File E includes five of the required data elements. Three of these data elements are used to identify the awardee and are included for all awardee organizations. The remaining two required data elements include the names of the five most highly compensated officers, and the total compensation for these individuals. These two data elements are only reported for organizations that receive over 80% or \$25,000,000 of their annual gross revenues in Federal funding.²⁰</p> <p>When agencies generate File E in the Broker, the Broker pulls the information from the SAM, operated by GSA. All organizations that do business with the Federal Government, or want to conduct business with the Federal Government, must have an active registration in SAM.</p> <p><i>File E data is the legal responsibility of the recipient and agencies are not responsible for certifying the quality of data reported by the awardees; therefore, we did not perform any testing procedures over those data elements reported.</i>²¹</p>
File F – FFATA Sub-award Attributes	<p>File F includes information on certain organizations that received procurement or financial assistance sub-awards during Q1 of FY 2019. Other than data elements used to identify the prime contractor or prime grantee, which enable the file to be linked to the other files, none of the required data elements are included in File F.</p> <p>When agencies generate File F in the Broker, the Broker pulls information from the FFATA Sub-award Reporting System (FSRS). GSA operates FSRS. If a prime contractor issues a sub-award for more than \$30,000, or if a prime grantee issues a sub-</p>

¹⁸ Treasury defines the action date data element as the date the award was issued/signed by the Government or a binding agreement was reached. There is no action date field in FPDS-NG; however, while executing audit procedures, Kearney noted that the action date in File D1 aligned with the “Date Signed” field in FPDS-NG.

¹⁹ 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 4.6, require that all Federal agencies collect and report procurement data to FPDS-NG for collecting and disseminating statistical procurement data to Congress, the Executive Branch and the private sector. At a minimum, agencies must report contract actions over the micro-purchase threshold.

²⁰ The Office of Federal Procurement Policy Act, as amended, 41 U.S.C. 401 et.seq., and FAR Subpart 52.204-10.

²¹ Guide, Section 200, Planning

DATA Act Submission File	File Description
	<p>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.</p> <p><i>File F data is the legal responsibility of the recipient and agencies are not responsible for certifying the quality of data reported by the awardees; therefore, we did not perform any testing procedures over those data elements reported.</i>²²</p>

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

SAO Certification

The responsibility for ensuring the accuracy of all files, agency-created and Broker-generated, 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 ability to coordinate across multiple communities and Federal Lines of Business.²³ Although OMB guidance does not name a position within the agency that should be the SAO, the guidance states that the SAO should be accountable for the quality and objectivity of internal controls over spending information. At NSF, the Head of the Office of Budget, Finance, and Award Management (BFA) serves as the SAO.²⁴ Accordingly, the Office of the Chief Financial Officer (CFO) is responsible for the implementation of the DATA Act. The SAO must provide reasonable assurance over the quality of the data submitted and document this assurance by certifying the DATA Act submission in the Broker. OMB guidance directs SAOs to verify that their data includes certain required linkages between files prior to certification. For example, the awardees included in File E should have transactions in Files C and D1 or C and D2. OMB guidance further states that when certifying the DATA Act submission, SAOs are “providing reasonable assurance that their internal controls support the reliability and validity of the agency account-level and award-level data.”²⁵

Agency Background and Mission

NSF was established when the NSF Act (42 United States Code [U.S.C.] 1861-75) was signed into law on May 10, 1950. NSF is responsible for the overall health and status of non-medical science and engineering communities across all disciplines. NSF initiates and supports scientific advances and research fundamental to the engineering process and programs to strengthen the nation’s science and engineering potential. Further, NSF supports education programs at all levels in all fields of science and engineering. NSF funds research and education in science by awarding grants and cooperative agreements to educational and research institutions in all parts of the United States. NSF is the funding source for 25%²⁶ of all federally supported basic scientific research conducted by America’s colleges and universities. Although NSF cannot

²² Guide, Section 200, *Planning*

²³ OMB M-10-06, *Open Government Directive*

²⁴ NSF’s SAO is currently the CFO.

²⁵ OMB M-17-04, *Additional Guidance for DATA Act Implementation: Further Requirements for Reporting and Assuring Data Reliability*

²⁶ FY 2018 NSF Agency Financial Report (AFR), Management Discussion and Analysis (MD&A);

<https://www.nsf.gov/pubs/2019/nsf19002/pdf/nsf19002.pdf>

legally operate research facilities (except in the polar regions), NSF enters into contractual relationships through awards to fund the research operations conducted by its grantees.

NSF management is responsible for managing risks and maintaining effective internal controls. The Federal Managers' Financial Integrity Act of 1982 (FMFIA) and OMB Circular A-123, Appendix A require NSF to evaluate its systems and provide reasonable assurance. NSF is funded through congressional appropriations to six different accounts; Research and Related Activities (R&RA), Education and Human Resources (EHR), Major Research Equipment and Facility Construction (MREFC), Agency Operations and Award Management (AOAM), National Science Board (NSB), and the OIG. Appropriations to the noted six accounts totaled \$8,075 million in FY 2019.²⁷

NSF's Process for Generating the DATA Act Submission

On March 19, 2019, NSF uploaded the required data to the Broker. The data needed to create Files A, B, and C resides in NSF's financial management system, iTRAK. Additionally, using the Broker, NSF extracted and generated the Files D1 (PIIDs), D2 (FAINs), E, and F for submission and certified the required files in the Broker. As noted in the **DATA Act Submission** section, the source for Files D1, D2, E, and F are Government-wide reporting systems. *Exhibit 1* and *Exhibit 2* outline how each file is populated into each of these systems.

File A – Appropriations Account Detail

File A includes the same information reported on the Standard Form (SF)-133, *Report on Budget Execution and Budgetary Resources*, which Treasury creates based on data received from the Government-wide Treasury Account Symbol Adjusted Trial Balance System (GTAS). Treasury provides an SF-133 crosswalk table to show the relationship of the GTAS elements to specific lines on the SF-133. On a monthly basis, agencies must submit their financial information to Treasury using GTAS.²⁸ Because File A contains the same information as the SF 133, NSF ensured the extracted File A data agreed to the applicable GTAS and SF-133 information for the Q1 FY 2019 DATA Act submission.

File B – Object Class and Program Activity Detail

As noted above in *Exhibit 1*, File B includes the same information as File A; however, the budgetary resource and status information in File B is presented by TAS, program activity, and object class. NSF's financial reporting process for generating its GTAS Adjusted Trial Balance file includes the necessary level of detail for its components. iTRAK prepares a Status of Funds report, which provides details about the current funds' status (e.g., budget authority, available balance, obligations delivered). The report is automatically created and exported from iTRAK and NSF uses it to help compare File B balances to TAS, program activity, and object class. NSF's Budget Division receives a Status of Funds report on a daily basis.

²⁷ H.R.648 – Consolidated Appropriations Act, 2019

²⁸ In FY 2019, agencies were required to submit at the end of each month, except October.

File C – Award Financial Data

NSF uses its internal financial system (i.e., iTRAK) to submit File C (Award Financial), which includes reportable record-level data. The Division of Acquisitions and Cooperative Support (DACS) and the Division of Institution and Award Support (DIAS) perform a review over Brokers output to check all iTRAK activity logged into FPDS-NG and Awards Management System (Awards). The files will be compared to check for discrepancies in records or amounts between C, D1, and D2. Depending on the issues, DACS or DIAS will determine if steps are needed to correct the discrepancies. The financial award and procurement data reported in File C should agree to the procurement and award information in FPDS-NG and Awards.

Files D1, D2, E, and F – Broker-Generated Files

On March 29, 2019, NSF, using the Broker, generated the Files D1, D2, E, and F for submission, as required by Treasury for this DATA Act submission. File D1 is created via FPDS-NG daily updates and includes additional information from other Treasury databases (e.g. SAM). File D2 is created with data from the Broker, via the agency’s FABS and other Treasury databases (e.g., SAM), which includes detailed financial assistance award information for record-level transactions. NSF must submit its financial assistance data (File D2) to FABS at least twice monthly and ensure the data is successfully validated. Federal awardees are responsible for updating SAM and FSRs, which are the source systems for Files E and F. NSF is responsible for ensuring controls are in place to verify that awardees register in SAM at the time of the financial assistance award and comply with NSF requirements.²⁹

As part of the agency’s quarterly submission process, the Broker conducts cross-file validations and performs various edit checks over the data submission. One of the edit check rules, per the DAIMS for File D1, is warning C11 which states, “Each unique PIID [Procurement Instrument Identifier] (or combination of PIID/ParentAwardId) from file C should exist in file D1.” Similarly, one of the edit check rules per DAIMS for File D2 is warning C8 which states, “Unique [Financial Assistance Identifier Numbers] FAIN and/or [Unique Record Identified] URI from File C should exist in File D2...” Per DAIMS, a warning does not mandate an error; however, it requires further investigation to ensure all information is reported correctly.

Recording Data in FPDS-NG

When NSF completes a procurement action in iTRAK, certain fields will be automatically transmitted to FPDS-NG, creating a new record in FPDS-NG. However, this process does not automatically populate all required fields in FPDS-NG. The Contracting Officer (CO) is responsible for entering the remaining fields directly into FPDS-NG. Once all the required fields in FPDS-NG are completed, the CO clicks the “Verify” button. The action must pass automatic edit checks in FPDS-NG to be recorded, which is noted by a “Final” status.

Recording Data in Awards

Awards is an application that provides NSF’s Division of Grants and Agreements (DGA) with

²⁹ OMB M-18-16, Appendix A to OMB Circular No. A-123, *Management of Reporting and Data Integrity Risk*

tools to process all award actions (funding and non-funding) electronically. Additionally, Awards updates relevant databases (e.g., eJacket) with new statuses and dates and connects to iTRAK to perform the obligation of funds when funding actions are approved. Awards information is then transmitted to FABS as a part of the File D2 submission.

Period of Performance Start Date for Procurement Awards

DAIMS defines the Period of Performance Start Date as the date on which, for the award referred to by the action being reported, awardee effort begins or the award is otherwise effective. For modifications of procurement awards, it is not clear whether “the award referred to” is the initial award or the modification and neither OMB nor Treasury’s DATA Act Program Management Office has issued guidance with specific instructions on the matter. Thus, for procurement awards with modifications, if agencies recorded the initial award date or the date of the modification as the start date, in accordance with their internal policies and procedures/practices, it is not an error for DATA Act reporting purposes.

Testing Limitations for Data Reported from Files E and F

As noted above in **Exhibit 2**, File E of the DAIMS contains additional awardee attribute information the Broker extracts from the SAM. File F contains sub-award attribute information the Broker extracts from the FSRS. Files E and F data remains the responsibility of the awardee in accordance with terms and conditions of Federal agreements; and the quality of this data remains the legal responsibility of the awardee. Therefore, agency SAOs are not responsible for certifying the quality of File E and F data reported by awardees, but they are responsible for assuring controls are in place to verify that financial assistance awardees register in SAM at the time of the award. As such, we assessed the completeness, accuracy, timeliness, and quality of the data extracted from SAM and FSRS via the Broker system. However, we did not consider any potentially incomplete, inaccurate, or untimely data extracted from SAM and FSRS via the Broker as an agency-specific error. See **Exhibit 13** for additional details.

Data Quality Plan (DQP)

On June 6, 2018, OMB issued M-18-16 which updates the OMB Circular A-123, *Management of Reporting and Data Integrity Risk*³⁰ reporting requirements. The agency must develop a DQP to achieve the objectives of the DATA Act. Based on CIGIE requirements, the DQP must be reviewed and assessed annually for three years or until the agency determines that sufficient controls are in place to achieve the reporting objective. The agency DQP should consider reviewing quarterly certifications of data submitted by the SAO, as well as documenting internal controls. The significant milestones reported by the agency should include an organizational structure over internal controls, management’s responsibilities in accordance with OMB Circular A-123, the test plan, and identification of high-risk data.

³⁰ OMB M-18-16 requires the DATA Act reporting agencies to implement a DQP effective FY 2019 through FY 2021 at a minimum.

Kearney assessed the long-term and short-term implementation plans developed as a part of NSF's DQP.³¹ The agency developed a timeline for the DQP, which began in November 2018. NSF prepared a DQP in accordance with OMB A-123 and included a five-step process covering each significant milestone pertaining to the organization structure and management responsibility, and a test plan to identify high-risk areas related to data linkage and inclusion of award data. NSF incorporated Enterprise Risk Management (ERM) strategies in January 2019 related to concepts of risk appetite, tolerance, strategy and objectives of internal control. The DATA Act ERM risk profile identified risks. Beginning in June 2019, NSF implemented internal controls over the DATA Act reporting approach. NSF conducted an assessment of internal control for each Green Book principle,³² prepared a summary of internal control deficiencies, and provided an overall assessment of internal controls.

³¹ NSF DQP, March 22, 2019

³² GAO's *Standards for Internal Control in the Federal Government*, <https://www.gao.gov/products/GAO-14-704G>, September 2014

ASSESSMENT OF THE DATA ACT SUBMISSION

Kearney reviewed a statistically valid sample of spending data that NSF submitted in Q1 FY 2019 under the DATA Act and found certain transactions were incomplete, inaccurate or untimely, and did not meet all quality requirements as outlined by OMB.³³ Specifically, of the 4,467 transactions included in NSF’s File C submission, we selected a sample of 355 transactions (8%) and reviewed supporting documentation to assess the completeness, accuracy, timeliness, and quality of the transaction-level data. *Exhibit 3* presents the summary results of testing.

Exhibit 3: Summary Results of Testing

Results	Completeness	Accuracy	Timeliness
Number of Transactions without Errors	126	123	125
Number of Transactions with One or More Data Elements Containing Errors	229	232	230
Total Transactions Tested	355	355	355

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

Completeness and Timeliness of the Agency Submission

We evaluated NSF’s DATA Act submission to the Broker and determined that the submission was complete and submitted timely. To be considered a complete submission, we evaluated Files A, B, and C to determine that all transactions and events that should have been recorded were recorded in the proper period.

Summary-Level Data and Linkages for Files A, B, and C

We reconciled Files A and B and determined through our testwork that they were accurate. Additionally, we reconciled the linkages between Files A, B and C and determined the linkages were valid and did not identify any significant variances between the files.

Record-Level Data and Linkages for Files C and D

We selected a sample of 355 detail award transactions reported in File C of NSF’s Q1 FY 2019 DATA Act Submission and tested 13,707 applicable data elements³⁴ for completeness, accuracy, and timeliness. Kearney identified record-level data linkage errors as a part of testing and reconciliation efforts between File C and File D1, as well as between File C and File D2. Kearney identified three separate findings. Please see the Findings section for detailed descriptions of the record-level data and linkage issues noted for File C and File D1/D2.

³³ OMB , Memorandum for Senior Accountable Officials Over the Quality of Federal Spending Information, Open Government Directive – Federal Spending Transparency, dated April 6, 2010 requires agencies to report on three key metrics: completeness, accuracy, and timeliness. These are the metrics that will be used to determine the quality of information.

³⁴ Not all of the 57 data elements from OMB and Treasury’s Government-wide financial data standards apply to each type of reportable detail award transaction.

Completeness of the Data Elements

According to the *Inspectors General Guide to Compliance under the DATA Act*, an agency’s data is complete when “[f]or each of the required data elements that should have been reported, the data element was reported in the appropriate Files A through D2.” The projected error rate³⁵ for the completeness of the data elements is 57.5%.³⁶ **Exhibit 4** presents the detailed completeness errors by data element.

Exhibit 4: Completeness Errors by Data Element

Data Element	Number of Transactions with Errors
Awardee/Recipient Legal Entity Name	227
Awardee/Recipient Unique Identifiers	227
Ultimate Parent Unique Identifier	226
Ultimate Parent Legal Entity Name	228
Legal Entity Address	226
Legal Entity Congressional District	226
Legal Entity Country Code	226
Legal Entity Country Name	226
Federal Action Obligation	226
Award Type	226
Catalog of Federal Domestic Assistance (CFDA) Number	226
CFDA Title	226
Award Description	226
Award Modification/Amendment	226
Action Date	226
Period of Performance Start Date	226
Period of Performance Current End Date	226
Primary Place of Performance Address	226
Primary Place of Performance Congressional	226
Primary Place of Performance Country Code	226
Primary Place of Performance Country Name	226
Award ID Number (PIID/FAIN)	226
Record Type	226
Action Type	226
Business Types	226
Funding Agency Name	226
Funding Agency Code	226
Funding Sub Tier Agency Name	226
Funding Sub Tier Agency Code	226

³⁵Per the Guide, Appendix 6 – Technical Statistical Sampling Technique, Section IV, *Design Choices to Stratify or Use Simple Random Section*, OIGs from a small or medium sized agency with an agency data file too large to test 100% may use a simple random sample. We considered NSF to be a small sized agency; however, the agency data file was too large for a census (i.e., 100% testing) to be feasible. As a result, we determined that a random sample was appropriate. Additionally, we do not have an in-house statistician and were not able to determine the upper and lower bounds based on a 95% confidence level. Therefore, our sampling error rate/results would be representative of the population as a whole.

³⁶ We noted that our sampling error rate is determined based on a projection of the total sampling errors. The error rate is calculated based on the average percentage of data elements noted as incomplete, inaccurate, and untimely per sampled transaction (e.g., if a record noted 41 applicable data elements, and 37 of the data elements were incomplete for one transaction, this would result in a 90% error rate).

Data Element	Number of Transactions with Errors
Funding Office Name	226
Funding Office Code	226
Awarding Agency Name	226
Awarding Agency Code	226
Awarding Sub Tier Agency Name	226
Awarding Sub Tier Agency Code	226
Awarding Office Name	226
Awarding Office Code	226
Total Incomplete Data Elements	8,366

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

Accuracy of the Data Elements

According to the Inspectors General Guide to Compliance Under the DATA Act, an agency’s data is accurate when “[a]mounts and other data relating to recorded transactions were recorded in accordance with the DAIMS Reporting Submission Specification Interface Definition Document (IDD), and the online data dictionary, and agree with the authoritative source records.” The projected error rate³⁷ for the accuracy of the data elements is 57.5%.³⁸ *Exhibit 5* presents the detailed accuracy errors by data element.

Exhibit 5: Accuracy Errors by Data Element

Data Element	Number of Transactions with Errors
Awardee/Recipient Legal Entity Name	227
Awardee/Recipient Unique Identifiers	227
Ultimate Parent Unique Identifier	228
Ultimate Parent Legal Entity Name	231
Legal Entity Address	226
Legal Entity Congressional District	226
Legal Entity Country Code	226
Legal Entity Country Name	226
Federal Action Obligation	226
Award Type	226
CFDA Number	226
CFDA Title	226
Award Description	226
Award Modification/Amendment	226
Action Date	226
Period of Performance Start Date	226

³⁷ Per the Guide, Appendix 6 – Technical Statistical Sampling Technique, Section IV, *Design Choices to Stratify or Use Simple Random Section*, OIGs from a small or medium sized agency with an agency data file too large to test 100% may use a simple random sample. We considered NSF to be a small sized agency; however, the agency data file was too large for a census (i.e., 100% testing) to be feasible. As a result, we determined that a random sample was appropriate. Additionally, we do not have an in-house statistician and were not able to determine the upper and lower bounds based on a 95% confidence level. Therefore, our sampling error rate/results would be representative of the population as a whole.

³⁸ We noted that our sampling error rate is determined based on a projection of the total sampling errors. The error rate is calculated based on the average percentage of data elements noted as incomplete, inaccurate, and untimely per sampled transaction (e.g., if a record noted 41 applicable data elements, and 37 of the data elements were incomplete for one transaction, this would result in a 90% error rate).

Data Element	Number of Transactions with Errors
Period of Performance Current End Date	226
Primary Place of Performance Address	226
Primary Place of Performance Congressional	226
Primary Place of Performance Country Code	226
Primary Place of Performance Country Name	226
Award ID Number	226
Record Type	226
Action Type	226
Business Types	226
Funding Agency Name	226
Funding Agency Code	226
Funding Sub Tier Agency Name	226
Funding Sub Tier Agency Code	226
Funding Office Name	226
Funding Office Code	226
Awarding Agency Name	226
Awarding Agency Code	226
Awarding Sub Tier Agency Name	226
Awarding Sub Tier Agency Code	226
Awarding Office Name	226
Awarding Office Code	226
Total Inaccurate Data Elements	8,371

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

Timeliness of the Data Elements

According to the *Inspectors General Guide to Compliance Under the DATA Act*, an agency’s data is timely when “[f]or each of the required data elements that should have been reported, the data elements were reported in accordance with the reporting schedules defined by the financial, procurement, and financial assistance requirements (FFATA, Federal Acquisition Regulation [FAR], FPDS-NG, FABS, and DAIMS).” The projected error rate³⁹ for the timeliness of the data elements is 57.7%.⁴⁰ **Exhibit 6** presents the detailed timeliness errors by data element.

Exhibit 6: Timeliness Errors by Data Element

Data Element	Number of Transactions with Errors
Awardee/Recipient Legal Entity Name	228
Awardee/Recipient Unique Identifiers	228
Ultimate Parent Unique Identifier	227
Ultimate Parent Legal Entity Name	229

³⁹ Per the Guide, Appendix 6 – Technical Statistical Sampling Technique, Section IV, *Design Choices to Stratify or Use Simple Random Section*, OIGs from a small or medium sized agency with an agency data file too large to test 100% may use a simple random sample. We considered NSF to be a small sized agency; however, the agency data file was too large for a census (i.e., 100% testing) to be feasible. As a result, we determined that a random sample was appropriate. Additionally, we do not have an in-house statistician and were not able to determine the upper and lower bounds based on a 95% confidence level. Therefore, our sampling error rate/results would be representative of the population as a whole.

⁴⁰ We noted that our sampling error rate is determined based on a projection of the total sampling errors. The error rate is calculated based on the average percentage of data elements noted as incomplete, inaccurate, and untimely per sampled transaction (e.g., if a record noted 41 applicable data elements, and 37 of the data elements were incomplete for one transaction, this would result in a 90% error rate).

Data Element	Number of Transactions with Errors
Legal Entity Address	227
Legal Entity Congressional District	227
Legal Entity Country Code	227
Legal Entity Country Name	227
Federal Action Obligation	227
Award Type	227
CFDA Number	226
CFDA Title	226
Award Description	227
Award Modification/Amendment	227
Action Date	227
Period of Performance Start Date	227
Period of Performance Current End Date	227
Primary Place of Performance Address	227
Primary Place of Performance Congressional	227
Primary Place of Performance Country Code	227
Primary Place of Performance Country Name	227
Award ID Number	227
Record Type	226
Action Type	227
Business Types	226
Funding Agency Name	227
Funding Agency Code	227
Funding Sub Tier Agency Name	227
Funding Sub Tier Agency Code	227
Funding Office Name	227
Funding Office Code	227
Awarding Agency Name	227
Awarding Agency Code	227
Awarding Sub Tier Agency Name	227
Awarding Sub Tier Agency Code	227
Awarding Office Name	227
Awarding Office Code	227
Current Total Value of Award	1
Potential Value of Award	1
North American Industrial Classification System (NAICS) Code	1
NAICS Description	1
Period of Performance Potential End Date	1
Ordering Period End Date	1
Parent Award ID Number	1
Total Untimely Data Elements	8,406

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

Quality of the Data Elements

The quality of the data elements was determined using the midpoint of the range of the proportion of errors (error rate) for completeness, accuracy and timeliness. The highest of the three error rates was used as the determining factor of quality. **Exhibit 7** provides the range of error in determining the quality of the data elements.

Exhibit 7: Data Quality Error Range

Highest Error Rate	Quality Level
0% to 20%	High
21% to 40%	Moderate
Greater than 40%	Low

Source: CIGIE FAEC Inspectors General Guide to Compliance under the DATA Act.

NSF reported 4,467 detail award transactions (i.e., records) in its File C submission. We selected a statistically valid sample of 355 transactions (350 FAINs and 5 PIIDs), containing 13,707 applicable data elements. We identified sampling error rates and determined out of the 13,707 applicable data elements, 8,366 (57.5%) contained completeness issues, 8,371 (57.5%) contained accuracy issues, and 8,406 (57.7%) contained timeliness issues. Included in the issues are errors not specifically attributable to NSF that resulted in data inaccuracies. Within this group a share of errors were attributable to non-NSF maintained data. We determined 2,940 of the 8,366 (7.7%) incomplete data elements, 2,945 of the 8,371 (7.7%) inaccurate data elements, and 2,953 of the 8,406 (7.7%) untimely data elements were not specifically attributable to NSF. Based on our test work and the highest error rate of 57.7%⁴¹, we determined that the quality of NSF’s data is considered low. For more information over the detailed error rates, please see **Appendix D**.

Implementation and Use of the Data Standards

We have evaluated NSF’s implementation and use of the Government-wide financial data standards for spending information as developed by OMB and Treasury. While NSF had implemented and used the data standards to enhance its ability to analyze and reconcile data from multiple sources (e.g., record-level linkage from File C to File D1 [PIIDs] and File D2 [FAINs]), NSF has not effectively implemented the data standards based on the identified completeness, accuracy, and timeliness errors within the reported data elements.

⁴¹ Kearney noted that our sampling error rate is determined based on a projection of the total sampling errors. The error rate is calculated based on the average percentage of data elements noted as incomplete, inaccurate, and untimely per sampled transaction (e.g., if a record noted 41 applicable data elements, and 37 of the data elements were incomplete for one transaction, this would result in a 90% error rate).

FINDINGS

Our performance audit resulted in three findings and four corresponding recommendations, as presented below. For criteria related to the findings, please see **Appendix I**. Additionally, for recommendations noted, please see the **Audit Results Summary and Recommendations** section.

Finding #1 – Incomplete Record-Level Linkage from File C (Financial) to File D2 (Award – Financial Assistance)

The financial assistance award information in NSF's File C (i.e., reportable record-level data) did not match the FAIN or URI in File D2 (i.e., detailed information for record level transactions reported in File C). Specifically, NSF's FY 2019 Q1 File C (i.e., NSF's iTRAK system) submission contained 4,467 financial award records (4,404 of which were transactions related to financial assistance awards), while the File D2 (i.e., NSF's Awards) submission contained 1,909 financial assistance award records. Per NSF's DQP, NSF's File D2 submission does not contain financial closeout transactions (e.g., deobligation of unspent funds) and transactions for post-financial close grantee adjustments, which are reported in File C. Upon data submission, the Broker noted 'Broker Warnings' to identify instances where there may be discrepancies between files C and D1/D2 (e.g., timing issues, manual adjustments, rounded values, and award transfers). NSF relies on the Broker warning messages to evaluate variances. NSF evaluated the differences and considered the variances to be legitimate differences and completed its data submission.

We identified incomplete linkages between File C and D2 as follows:

- **Population Discrepancies:** NSF's File C data included 2,168 instances of FAINs in File C that did not exist in File D2. NSF reviewed the warnings provided by the Broker and determined the warnings to be legitimate differences based on NSF reporting financial closeout transactions and post-financial close grantee adjustments only in File C and not in File D2
- **Testing Discrepancies:** NSF's FY 2019 Q1 File C submission was determined to be complete and therefore suitable for use as the population for sample selection. Of the 350 transactions selected from File C for detailed FAIN testing, 226 transactions were not included within File D2 as part of the Q1 Submission. NSF determined these transactions to be legitimate differences based on NSF's business practice of reporting financial closeout transactions and post-financial close grantee adjustments only within File C and not within File D2.

NSF used the Broker to generate Files D1, D2, E, and F for submission and certification in March 2019, after the end of Q1 reporting. The Broker generated File D2 based upon the information included in FABS. Of the 350 transactions sampled from File C, 226 were not included in File D2 because NSF determined them to be legitimate differences between its financial system (i.e., iTRAK) and awards management system (i.e., Awards). NSF stated the warnings are legitimate differences resulting from necessary financial transactions required after the award has expired (i.e., transactions that are only reported in File C and not in File D2).

As a part of its business practices, NSF determined that deobligated amounts/downward adjustments (i.e., financial closeout transactions and transactions for post-financial close grantee adjustments) should only be reported in iTRAK (File C) and not in Awards (File D2). Further, NSF does not utilize Awards as an accounting ledger, and therefore does not record the adjustments there. As a result, these transactions are not reported in FABS, and therefore do not appear in File D2, resulting in incomplete data.⁴²

In addition, NSF relied on the Broker warnings to identify potential variances between File C and File D2 to ensure that data reported to USAspending.gov was complete, accurate, timely, and therefore, of reliable quality. While timing differences between Files C and D2 are considered valid explanations for warnings, differences that will not reconcile are not legitimate differences.

Due to the incomplete transactions and transactions not recorded timely in NSF's DATA Act file submissions, USAspending.gov may not accurately reflect all NSF award actions. As a result, NSF increases the risk that incomplete and inaccurate data will be uploaded to USAspending.gov, decreasing the completeness, accuracy, and timeliness, and therefore, the reliability and quality of the data.

⁴² NSF DQP, File III.1 Warnings Log-Updated (D2 Warnings)

Finding #2 – Incomplete Record-Level Linkage from File C (Financial) to File D1 (Award – Procurement)

NSF’s FY 2019 Q1 File C, the Award Financial File, did not match File D1, the Award Procurement File. Procurement award information in File C should match the Unique Record Identified in File D1. However, we found that NSF’s File C (i.e., iTRAK) submission contained 4,467 financial award records (of which 63 transactions related to procurement), while the File D1 (i.e., FPDS-NG) submission contained 83 PIID records. Upon data submission, the Broker noted ‘Broker Warnings’ to identify instances of potential discrepancies between File C and File D1 (e.g., timing issues, manual adjustments, and rounded values). NSF relies on the Broker warning messages to evaluate variances. NSF evaluated the differences and considered the variances to be legitimate differences and completed its data submission.

We identified the following incomplete linkages between File C and D1:

- **Population Discrepancies:** NSF’s File C data included 11 instances of PIIDs in File C that did not exist in File D1. Additionally, one PIID existed in File D1, but did not exist within File C. NSF reviewed the warnings provided by the Broker and determined the discrepancies to be timing differences
- **Testing Discrepancies:** NSF’s FY 2019 Q1 File C submission was determined to be complete and therefore suitable for use as the population for sample selection. Of the five PIIDs selected from File C for detailed PIID testing, one transaction was not included within File D1 as part of the Q1 submission. NSF provided reasonable explanations of the Broker warnings and determined that a journal voucher (JV) correction was not made timely. The transaction was complete and accurate, but untimely. An FPDS-NG deobligation in Quarter 4 (Q4) of FY 2018 was not posted in NSF’s financial system (i.e., iTRAK) until Q1 of FY 2019.

NSF relies on the Broker warnings to identify and remediate any instances of incomplete transaction linkages between Files C and D1 to ensure that all necessary procurement transactions are reported timely. After the end of Q1 reporting, NSF used the Broker to generate Files D1, D2, E, and F for submission and certification in March 2019. The Broker generated File D1 based upon the information included in FPDS-NG. Data was reported accurately in both the iTRAK (financial system) and FPDS-NG (procurement awards).

Additionally, one of the five transactions selected for testing was not included in File D1 because NSF did not record it timely in both FPDS-NG and iTRAK (i.e., within the same accounting period/quarter). Untimely recording occurred because NSF did not perform reviews to ensure that transactions were recorded in the appropriate time period. Due to the nature of NSF’s financial system (iTRAK), once a purchase order (PO) line item has been canceled, iTRAK does not allow any obligating or de-obligating activity against that line item.

As a result of incomplete transactions (i.e., award ID linkage) in NSF’s DATA Act file submissions, NSF reported data that contained incomplete and untimely linkages between File C and D1 within the overall population, as well as within individual transactions selected for testing that are reportable in both Files C and D1. Additionally, transactions not reported in FPDS-NG within three business days of the contractual award date may result in information not

being reported and available to the public on USAspending.gov in a timely manner. NSF increases the risk that data uploaded to USAspending.gov is incomplete and untimely, which decreases the reliability and quality of the data.

Finding #3 – Inaccurate Reporting of Data Elements within SAM

Five FAIN transactions and one PIID transaction (from samples of 350 FAIN and 5 PIID transactions, respectively) in NSF’s FY 2019 Q1 submission reported incomplete, inaccurate, and/or untimely information derived from SAM. As noted in the table below, the information found in Files D1 and D2 did not agree to the information in the SAM documentation (i.e., screenshots from SAM.gov) provided by NSF. The data in SAM is entered and maintained by the recipient for validation purposes. Certain data elements (e.g., Ultimate Parent Unique Identifier and Ultimate Parent Legal Name) are populated in File D1/D2 through the Broker extractions. Specifically, the Broker downloads SAM data through an interface process to populate certain File D1/D2 elements. These elements will not be populated in Files D1 and D2 if the information is not submitted to SAM or if the Data Universal Numbering System (DUNS) number is not registered in SAM.

NSF is responsible for assuring controls are in place to verify the awardees register in SAM at the time of the financial assistance award and comply with NSF requirements⁴³. It is the responsibility of the awardee to review and update its information in the SAM database on an annual basis to ensure it is complete, accurate, and timely.

Although NSF does not have the ability to update the information submitted by the awardee to SAM, NSF submitted tickets to Treasury/General Services Administration (GSA) in response to audit inquiries. However corrections were not completed until after the FY 2019 Q1 reporting period.

Exhibit 8: SAM Accuracy Errors

Data Element(s)	File (D1/D2)	Number of Sample Records	Incomplete	Inaccurate	Untimely	Correction Submitted
Ultimate Parent Legal Entity Name	File D1	1		X		X
Awardee/Recipient Legal Entity Name and Awardee/Recipient Unique Identifier*	File D2	1	X	X	X	X
Ultimate Parent Legal Entity Name	File D2	2	X	X	X	
Ultimate Parent Unique Identifier and Ultimate Parent Legal Entity Name	File D2	2		X		X

Source: Kearney developed

* NSF submitted a ticket to Treasury/GSA to correct the inaccuracy for one FAIN transaction related to the incorrect submission by the awardee after audit inquiries related to the completed Q1 submission. NSF noted that the awardee/recipient submitted its DUNS number incorrectly; therefore, the SAM data did not populate correctly and could not be verified for completeness or accuracy.

NSF did not adequately review the File D1/D2 submission to ensure that SAM-derived elements were complete, accurate, and timely. In response to audit requests related to the data element discrepancies, NSF presented additional documentation to verify that corrections were made after FY 2019 Q1 reporting. In addition, although the errors noted are not specifically

⁴³ OMB M-18-16, Appendix A to OMB Circular No. A-123, *Management of Reporting and Data Integrity Risk*, Footnote 3

attributable to the agency, NSF has taken actionable steps to mitigate the discrepancies found in SAM through communication and collaboration with Treasury and GSA.

Due to the incomplete transactions and transactions not recorded timely in NSF's DATA Act file submissions, USAspending.gov may not accurately reflect awardee information reported through SAM.gov.

Audit Results Summary and Recommendations

Kearney concludes that the FY 2019 NSF Q1 DATA Act submission did not provide high-quality information according to the Guide Data Quality Error Range guidelines. While NSF took steps to implement and use the Government-wide data standards, problems with completeness, accuracy, and timeliness hinder the agency's ability to provide reliable and high-quality data, achieve full transparency to the public, and comply with Federal accountability requirements. The four recommendations noted below, if implemented, will improve internal control and business processes to ensure that NSF consistently and effectively uses the Government-wide data standards to provide reliable spending data in USAspending.gov.

We recommend that NSF's SAO and NSF Management:

1. Develop and implement a methodology to ensure that NSF systems (e.g., iTRAK and Awards) reconcile or obtain an official ruling (e.g., documentation from Treasury) to validate NSF's methodology and business process of treating File C and File D2 variances as legitimate permanent differences.
2. Develop and implement procedures to ensure timely review and complete reporting of the data reported to FPDS-NG, including procedures to validate the accuracy of data entered into NSF systems that interface with FPDS-NG.
3. Develop monitoring procedures to ensure that the review of all SAM-derived information is complete, accurate, and timely prior to submission to USAspending.gov. Procedures may include implementation of additional steps added to the monthly validation of FABS and FPDS-NG to ensure that the review of all derived information is complete, accurate, and timely.
4. Develop formal procedures to periodically review the reliability and accuracy of all data submitted by awardees/recipients within SAM.

Management's Response

Kearney reviewed NSF Management's response to the findings and recommendations and noted the following:

- Recommendation #1 – NSF Management did not concur with the finding and recommendation; however, they do agree to continued collaboration and communication to seek a resolution towards clarified guidance
- Recommendation #2 – NSF Management concurred with the finding and recommendation
- Recommendation #3 – NSF Management partially concurred with the findings, but fully concurred with the recommendation.
- Recommendation #4 – NSF Management partially concurred with the finding, but did not concur with the recommendation.

Please see **Appendix E** for NSF Management's formal response and **Appendix F** for Kearney's rebuttal.

APPENDIX A: PURPOSE, SCOPE, AND METHODOLOGY

Purpose, Scope, and Methodology

The Digital Accountability and Transparency Act of 2014⁴⁴ (DATA Act) requires each Federal agency's Office of Inspector General (OIG) to review a statistically valid sample of the spending data submitted by its agency; assess the completeness, accuracy, timeliness, and overall quality of the data sampled; and evaluate the agency's implementation and use of Government-wide financial data standards. OIGs are required to submit to Congress and make publicly available a report of the results of the assessment.

Kearney & Company, P.C. (referred to as "Kearney," "we," and "our" in this document) conducted fieldwork for this performance audit from April 2019 through October 2019 in the Washington, D.C. metropolitan area. The audit was conducted in accordance with the Government Accountability Office's (GAO) Generally Accepted Government Auditing Standards (GAGAS), 2011 revision, issued by the Comptroller General of the United States. 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. The purpose of this report is to communicate the results of Kearney's performance audit, as well as our related findings and recommendations.

An audit involves performing procedures to obtain evidence about the performance, effectiveness, and efficiency of a program or agency. The audit procedures selected depend on the auditor's judgment, including an assessment of the risks of noncompliance with regulations and best practices in acquisition. An audit also includes evaluating the appropriateness of policies and procedures used and the reasonableness of decisions made by management, as well as evaluating the overall presentation of assertions made by management.

The scope of this DATA Act performance audit is fiscal year (FY) 2019, First Quarter (Q1) financial and award data that the National Science Foundation (NSF) submitted for publication on USAspending.gov and any applicable procedures, certifications, documentation, and controls to achieve this process.

On February 14, 2019, the Council of the Inspectors General on Integrity and Efficiency's (CIGIE) Federal Audit Executive Council (FAEC), in consultation with GAO, published the *CIGIE FAEC Inspectors General Guide to Compliance Under the DATA Act* (Guide), which presents a common methodological and reporting approach for the IG community to use in performing its mandated work.

⁴⁴ P.L. No. 113-101

The overall objective of our performance audit was to evaluate NSF’s compliance with the DATA Act’s reporting requirements. Kearney used the Guide as the template for detailed testing procedures. The Guide lists the testing objective as the assessment of the:

- Completeness, accuracy, timeliness, and quality of the FY 2019 Q1 financial and award data submitted for publication on USAspending.gov
- Federal agency’s implementation and use of Government-wide financial data standards established by Office of Management and Budget (OMB) and Department of the Treasury (Treasury).

To accomplish these objectives, we obtained an understanding of the regulatory criteria related to NSF’s responsibilities to report financial and award data under the DATA Act. We assessed NSF’s systems, processes, and internal controls in place over data management under the DATA Act. We also assessed the general and application controls pertaining to the financial management systems (i.e., iTRAK) from which the data elements were derived and linked. We assessed NSF’s internal controls in place over financial and award data reported to USAspending.gov per OMB Circular A-123, *Management’s Responsibility for Internal Control*. We also reviewed a statistically valid sample from FY 2019 Q1 financial and award data submitted by NSF on USAspending.gov. Kearney assessed the completeness, accuracy, timeliness, and quality of the financial and award data sampled. Lastly, we assessed NSF’s implementation and use of the 57 data definition standards established by OMB and Treasury.

According to the Guide in order to accomplish the objectives of the DATA Act compliance review, OIGs should:

- Obtain an understanding of any regulatory criteria related to its agency’s responsibilities to report financial and award data under the DATA Act
- Review its agency’s Data Quality Plan (DQP)
- Assess the internal and information system controls in place as they relate to the extraction of data from the source systems and the reporting of data to the Broker in order to assess audit risk and design audit procedures
- Review and reconcile the FY 2019 Q1 summary-level data submitted by the agency for publication on USAspending.gov
- Review a statistically valid sample from FY 2019 Q1 financial and award data submitted by the agency for publication on USAspending.gov
- Assess the completeness, accuracy, timeliness, and quality of the financial and award data sampled
- Assess its agency’s implementation and use of the 57 data definition standards established by OMB and Treasury.

In accordance with the Guide, the scope of this audit was NSF’s submission of FY 2019 Q1 data. According to Section 100, *Introduction*, of the Guide: “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, we conducted our audit based upon this guidance. Professional judgment was used to customize certain recommended testing procedures based on NSF’s environment, systems, and data.

To obtain background information, we researched and reviewed Federal laws and regulations, as well as prior GAO audit reports. Kearney also reviewed the United States Code (U.S.C.), OMB Circulars and Memoranda, guidance published by the 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. We also obtained an understanding of processes to record procurement and financial assistance awards in NSF systems and other Federal systems.

The Guide instructed audit teams to assess the agencies use and implementation of 57 standard data elements⁴⁵. Six of these data elements are reported at the summary level in File A or File B, rather than the individual transaction level. As reported in the **Audit Results Summary and Recommendations** section of this report, to test these data elements, Kearney tested procedures implemented by NSF to confirm the validity and accuracy of these six account summary level data elements. Specifically, we determined that the data was appropriately linked between File A and File B and the Standard Form (SF)-133, *Report on Budget Execution and Budgetary Resources*. For the remaining 51 data elements, Kearney selected a statistical sample of individual transactions included in NSF’s File C submission. See additional information in the **Detailed Sampling Methodology** section of this appendix.

Prior Reports

In the FY 2017 DATA Act audit, Kearney reported four findings regarding instances of incomplete data elements, inaccurate data elements, untimely transactions, and issues with DATA quality for NSF’s FY 2017 Q2 submission. Kearney noted that the data reported in Files A and B was complete, accurate, timely, and met quality requirements. However, after reviewing a statistically valid sample of spending data reported in Files C, D1, D2, and E, Kearney noted that data reported was incomplete, inaccurate, and untimely. Kearney reviewed a sample of 254 transactions and determined 98.8% of transactions were incomplete, 62.2% of transactions were inaccurate, and 0.8% of transactions were untimely. Additionally, Kearney identified three types on errors, two of which were Government-wide reporting errors (Broker errors and Award Submission Portal [ASP] errors) at the Treasury level. As a result, Kearney calculated separate rates for NSF errors, the Broker errors, and ASP (now known as FABS)-derived errors to distinguish between the nature and extent of variances identified at the transaction level.

⁴⁵ 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/> (accessed on September 14, 2017).

In response to the prior-year findings, and as part of their DQP process, NSF management implemented internal controls over the DATA Act reporting approach and conducted an assessment for each GAO *Standards for Internal Control in the Federal Government* (Green Book) principle, prepared a summary of internal controls deficiencies, and provided an overall assessment of internal controls.

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 completeness, accuracy, 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.⁴⁶ Additionally, OMB guidance states that when certifying the DATA Act submission, Senior Accountable Officials (SAO) are “providing reasonable assurance that their internal controls support the reliability and validity of the agency account-level and award-level data.”⁴⁷

According to DATA Act guidance, agencies are required to confirm that: 1) the information reported in File A matched the December 31, 2018 SF-133; 2) File A matched the totals included in File B;⁴⁸ 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 noted no difference. Additionally, through these reconciliations, we validated the required data elements, which are presented in the files.⁴⁹

Kearney performed a reconciliation between Files C and D1/D2, as well as a reconciliation of data linkages between Files C and File D1/File D2 and noted various differences. We determined that the linkage discrepancies between File C to File D1 were due to transactions not being reported timely and the File C to File D2 discrepancies were the result of NSF’s determination that differences resulting from necessary financial transactions required after the award expired, which are reported on File C but omitted from File D2, did not need to be corrected.

In addition to performing this DATA Act performance audit, Kearney also performs NSF’s financial statement audit and Federal Information Security Management Act of 2002 (FISMA)

⁴⁶ OMB M-17-04, Section 3, *Quarterly SAO Assurance of DATA Act Data*

⁴⁷ OMB M-17-04

⁴⁸ 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.

⁴⁹ Kearney tested the following six data elements through reconciliations: Appropriation Account, Budget Authority Appropriated, Other Budgetary Resources, Outlays, Program Activity, and Unobligated Balance.

performance audit. Accordingly, we relied on this work to test internal controls specifically related to the DATA Act. Kearney's 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 Audit Team also tested security management, access controls, configuration management, segregation of duties, and contingency planning over 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 performance audit.

On June 6, 2018, Appendix A of the A-123 Circular was amended by OMB, creating a requirement for agencies to develop a DQP to achieve the objectives of the DATA Act. The DQP considers incremental risks to data quality in Federal spending data and any controls that would manage such risks in accordance with OMB M-18-16, *New Requirement for Data Quality Plan*. The purpose of the DQP is to identify and develop a control structure tailored to address identified risks. Kearney reviewed NSF's DQP and identified the following elements required by the DATA Act: organizational structure, key processes, management's roles and responsibilities, and NSF's testing plan and identification of high risks.

Kearney identified additional internal controls, including general and application controls in source systems, designed by NSF to ensure that data was complete, accurate, 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 Kearney 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 (e.g., a vendor's place of performance) rather than source system internal controls. Accordingly, we designed 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 objective of this engagement was to audit the amounts and information included in the submission by tracing information to source documentation, as described in the *Audit Results Summary* section of this report, additional steps were not considered necessary to assess the sufficiency of computer-processed data.

Detailed Sampling Methodology

The Guide initially recommends a sample of 385⁵⁰ certified spending data transactions for transaction-level testing from NSF’s FY 2019 Q1 DATA Act File C submission. However, it also provides a correction formula for small agencies, which we used to select a statistically valid random sample of 355⁵¹ transactions included in File C using random sampling software.

Exhibit 9 provides details on File C and the sample selected.

Exhibit 9: File C Analysis and Sampling

	Number of Transactions	Amount Obligated
Total Transactions in File C	4,467	299,375,278
Sampled Transactions (amount)	355	19,387,843*
Sampled Transactions (percent)	7.9%	6.5%

Source: Prepared by Kearney based upon analysis of NSF’s Q1 FY 2019 File C.

*Kearney analyzed the File C sample selection as absolute values to include upward and downward adjustments.

⁵⁰ Section 560.02 of the Guide recommends a sample size of 385 detail award transactions. However, agencies with a smaller population and high expected error rates (i.e., where a sample size of 385 represents 5% or more of the population) may reduce the recommended sample size.

⁵¹ Section 430.02 of the Guide requires a sample size of 385 transactions; however, it also provides a correction formula for agencies where a sample size of 385 represents 5% or more of the population. Applying this correction formula – $385/[1+(385/N)]$ – to NSF’s 4,467 transaction File C population, Kearney selected 355 samples.

APPENDIX B: REQUIRED DATA ELEMENTS FOR FEDERAL AGENCY REPORTING

Exhibit 10: Required Data Elements for Federal Agency Reporting

Data Element No.	Data Element	Data Description	Submission File
1	Awardee/Recipient Legal Entity Name	The name of the awardee or recipient that relates to the unique identifier.	Files D1 and D2
2	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
3	Ultimate Parent Unique Identifier	The unique identification number for the ultimate parent of an awardee or recipient.	Files D1, D2 and E
4	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
5	Legal Entity Address	The awardee or recipient’s legal business address where the office represented by the Unique Entity Identifier (as registered in the System for Award Management [SAM]) is located.	Files D1 and D2
6	Legal Entity Congressional District	The congressional district in which the awardee or recipient is located. This is not a required data element for non-United States addresses.	Files D1 and D2
7	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
8	Legal Entity Country Name	The name corresponding to the Country Code.	Files D1 and D2
9	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
10	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
11	Federal Action Obligation	Amount of Federal Government’s obligation, de-obligation, or liability, in dollars, for an award transaction.	Files D1 and D2
12	Non-Federal Funding Amount	For financial assistance, the amount of the award funded by non-Federal source(s), in dollars.	File D2
13	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
14	Current Total Value of Award	For procurement, the total amount obligated to date on a contract, including the base and exercised options.	File D1
15	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

Data Element No.	Data Element	Data Description	Submission File
16	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
17	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
18	NAICS Description	The title associated with the NAICS Code.	File D1
19	CFDA Number	The number assigned to a Federal area of work in the Catalog of Federal Domestic Assistance (CFDA).	File D2
20	CFDA Title	The title of the area of work under which the Federal award was funded in the CFDA.	File D2
21	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
22	Award Description	A brief description of the purpose of the award.	Files D1 and D2
23	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
24	Parent Award Identification (ID) Number	The identifier of the procurement award under which the specific award is issued (e.g., a Federal Supply Schedule [FSS]).	File D1
25	Action Date	The date the action being reported was issued/signed by the Government or a binding agreement was reached.	Files D1 and D2
26	Period of Performance Start Date	The date on which awardee effort begins or the award is otherwise effective.	Files D1 and D2
27	Period of Performance Current End Date	The current date on which awardee effort completes or the award is otherwise ended.	Files D1 and D2
28	Period of Performance Potential End Date	The date on which, awardee effort is completed or the award is otherwise ended.	File D1
29	Ordering Period End Date	The date on which no additional orders referring to it (the award) may be placed.	File D1
30	Primary Place of Performance Address	The address where the predominant performance of the award will be accomplished. Components include: Address Lines 1 and 2, City, County, Agency Code, and ZIP+4 or Postal Code.	Files D1 and D2
31	Primary Place of Performance Congressional District	United States congressional district where the predominant performance of the award will be accomplished; derived from the Primary Place of Performance Address.	Files D1 and D2
32	Primary Place of Performance Country Code	Country code where the predominant performance of the award will be accomplished.	Files D1 and D2
33	Primary Place of Performance Country Name	Name of the country represented by the country code where the predominant performance of the award will be accomplished.	Files D1 and D2

Data Element No.	Data Element	Data Description	Submission File
34	Award ID Number	The unique identifier of the specific award being reported, i.e., Federal Award Identification Number (FAIN) for financial assistance and Procurement Instrument Identifier (PIID) for procurement.	Files C, D1 and D2
35	Record Type	Code indicating whether an action is an individual transaction or aggregated.	File D2
36	Action Type	A technical communication document intended to give assistance to users of a particular system.	Files D1 and D2
37	Business Types	A collection of indicators of different types of recipients based on socio-economic status and organization/business areas.	File D2
38	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
39	Funding Agency Code	The three-digit Common Government-wide Accounting Classification (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
40	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
41	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
42	Funding Office Name	Name of the level n organization that provided the preponderance of the funds obligated by this transaction.	Files D1 and D2
43	Funding Office Code	Identifier of the level n organization that provided the preponderance of the funds obligated by this transaction.	Files D1 and D2
44	Awarding Agency Name	The name associated with a department or establishment of the Government as used in the Treasury Account Fund Symbol (TAFS).	Files D1 and D2
45	Awarding Agency Code	A department or establishment of the Government as used in the TAFS.	Files D1 and D2
46	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
47	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
48	Awarding Office Name	Name of the level n organization that awarded, executed or is otherwise responsible for the transaction.	Files D1 and D2
49	Awarding Office Code	Identifier of the level n organization that awarded, executed or is otherwise responsible for the transaction.	Files D1 and D2

Data Element No.	Data Element	Data Description	Submission File
50	Object Class	Categories in a classification system that presents obligations by the items or services purchased by the Federal Government.	Files B and C
51	Appropriations Account	The basic unit of an appropriation generally reflecting each unnumbered paragraph in an appropriation act.	Files A and B ^c
52	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
53	Obligation	A legally binding agreement that will result in outlays, immediately or in the future.	Files A, B, and C
54	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
55	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
56	Program Activity	A Federal mandate that all electronic and information technology (IT) developed, procured, maintained, or used by the Federal Government be accessible to people with disabilities.	Files B ^b
57	Outlay	A specific activity or project as listed in the program and financing schedules of the annual budget of the United States Government.	Files A and B ^a

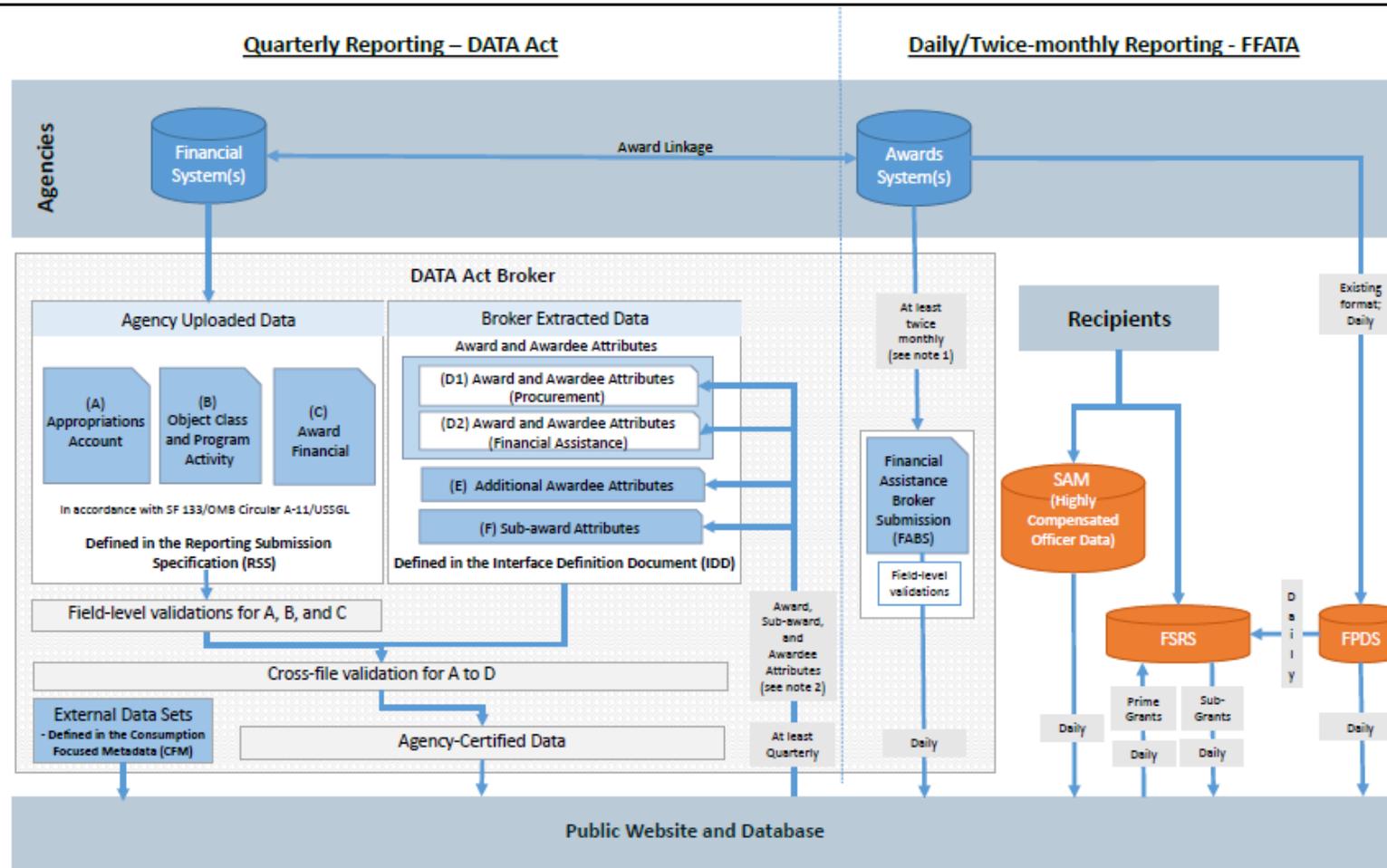
Source: <https://max.gov/maxportal/assets/public/offm/DataStandardsFinal.htm>

^a Per the 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 (NSF) elected to not report this optional data element in File C. Accordingly, we 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, we tested this data element in 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



Note 1: The Financial Assistance Broker Submission (FABS) replaces the Award Submission Portal (ASP).

Note 2: D1 and D2 pull in all award data associated with the submitting agency and agency-specified action dates. E pulls in highly-compensated officer information for DUNS numbers that appear in an agency's D1 and D2.

F pulls in all sub-award data associated with the awards that appear in an agency's D1 and D2.

Schema Version 1.2.1
Friday, February 6, 2019

Source: Department of the Treasury (Treasury). Amendments made to the DAIMS can be found at <https://www.fiscal.treasury.gov/data-transparency/resources.html/>

APPENDIX D: NSF RESULTS FOR THE DATA ELEMENTS

Exhibit 11: Summary Results of Testing

Data Element No.	Data Element Name	Error Rate		
		C	A	T
1	Awardee/Recipient Legal Entity Name	63.9%	63.9%	64.2%
2	Awardee/Recipient Unique Identifier	63.9%	63.9%	64.2%
3	Ultimate Parent Unique Identifier	63.7%	64.2%	63.9%
4	Ultimate Parent Legal Entity Name	64.2%	65.1%	64.5%
5	Legal Entity Address	63.9%	63.7%	63.9%
6	Legal Entity Congressional District	63.7%	63.7%	63.9%
7	Legal Entity Country Code	63.7%	63.7%	63.9%
8	Legal Entity Country Name	63.7%	63.7%	63.9%
9*	Highly Compensated Officer Name	N/A	N/A	N/A
10*	Highly Compensated Officer Total Compensation	N/A	N/A	N/A
11	Federal Action Obligation	63.7%	63.7%	63.9%
12*	Non-Federal Funding Amount	N/A	N/A	N/A
13*	Amount of Award	N/A	N/A	N/A
14	Current Total Value of Award	0.00%	0.00%	20.0%
15	Potential Total Value of Award	0.00%	0.00%	20.0%
16	Award Type	63.7%	63.7%	63.9%
17	North American Industrial Classification System (NAICS) Code	0.00%	0.00%	20.00%
18	NAICS Description	0.00%	0.00%	20.00%
19	Catalog of Federal Domestic Assistance (CFDA) Number	64.6%	64.6%	64.6%
20	CFDA Title	64.6%	64.6%	64.6%
21*	Treasury Account Symbol (excluding Sub-Account)	N/A	N/A	N/A
22	Award Description	63.7%	63.7%	63.9%
23	Award Modification/Amendment Number	63.7%	63.7%	63.9%
24	Parent Award ID Number	0.00%	0.00%	20.00%
25	Action Date	63.7%	63.7%	63.9%
26	Period of Performance Start Date	63.7%	63.7%	63.9%
27	Period of Performance Current End Date	63.7%	63.7%	63.9%
28	Period of Performance Potential End Date	0.00%	0.00%	20.0%
29	Ordering Period End Date	0.00%	0.00%	20.0%
30	Primary Place of Performance Address	63.7%	63.7%	63.9%
31	Primary Place of Performance Congressional District	63.7%	63.7%	63.9%
32	Primary Place of Performance Country Code	63.7%	63.7%	63.9%
33	Primary Place of Performance Country Name	63.7%	63.7%	63.9%
34	Award ID Number (PIID/FAIN)	63.7%	63.7%	63.9%
35	Record Type	64.6%	64.6%	64.6%
36	Action Type	63.7%	63.7%	63.9%
37	Business Types	64.6%	64.6%	64.6%
38	Funding Agency Name	63.7%	63.7%	63.9%
39	Funding Agency Code	63.7%	63.7%	63.9%
40	Funding Sub Tier Agency Name	63.7%	63.7%	63.9%
41	Funding Sub Tier Agency Code	63.7%	63.7%	63.9%
42	Funding Office Name	63.7%	63.7%	63.9%
43	Funding Office Code	63.7%	63.7%	63.9%
44	Awarding Agency Name	63.7%	63.7%	63.9%
45	Awarding Agency Code	63.7%	63.7%	63.9%
46	Awarding Sub Tier Agency Name	63.7%	63.7%	63.9%

Data Element No.	Data Element Name	Error Rate		
		C	A	T
47	Awarding Sub Tier Agency Code	63.7%	63.7%	63.9%
48	Awarding Office Name	63.7%	63.7%	63.9%
49	Awarding Office Code	63.7%	63.7%	63.9%
50	Object Class	0.00%	0.00%	0.00%
51	Appropriations Account	0.00%	0.00%	0.00%
52*	Budget Authority Appropriated	N/A	N/A	N/A
53	Obligation	0.00%	0.00%	0.00%
54*	Unobligated Balance	N/A	N/A	N/A
55*	Other Budgetary Resources	N/A	N/A	N/A
56*	Program Activity	N/A	N/A	N/A
57*	Outlay	N/A	N/A	N/A

Source: Prepared by Kearney based upon analysis of NSF's FY 2019 Q1 File C.

*NSF did not report on this Data Element; therefore, Kearney did not count Data Element in final error rate.

Exhibit 12: Accuracy of Dollar Value-Related Data Elements

PIID/FAIN	Data Element No.	Data Element	Accurate	Not Accurate	Not Applicable	Total Tested	Error Rate	Absolute Value of Errors
PIID	11	Federal Action Obligation	3	0	2	5	0%	\$0.00
PIID	14	Current Total Value of Award	3	0	2	5	0%	\$0.00
PIID	15	Potential Total Value of Award	3	0	2	5	0%	\$0.00
PIID	53	Obligation	4	0	1	5	0%	\$0.00
FAIN	11	Federal Action Obligation	102	226	22	350	63.7%	\$1,548,338
FAIN	53	Obligation	350	0	0	350	0	\$0.00

Source: Prepared by Kearney based upon analysis of NSF's FY 2019 Q1 File C.

Exhibit 13: Errors in Data Elements Not Attributable to the Agency

PIID/FAIN	Data Element No.	Data Element	Error Attributed to	Error Rate		
				C	A	T
PIID/FAIN	3	Ultimate Parent Unique Identifier	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	4	Ultimate Parent Legal Entity Name	Broker Extracting from FPDS-NG/FABS	7.8%	7.8%	7.8%
PIID/FAIN	7	Legal Entity Country Code	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	33	Primary Place of Performance Country Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
FAIN	37	Business Types	Broker Extracting from FABS	7.7%	7.7%	7.7%
PIID/FAIN	38	Funding Agency Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%

PIID/FAIN	Data Element No.	Data Element	Error Attributed to	Error Rate		
				C	A	T
PIID/FAIN	40	Funding Sub Tier Agency Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	41	Funding Sub Tier Agency Code	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	42	Funding Office Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	44	Awarding Agency Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	46	Awarding Sub Tier Agency Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	47	Awarding Sub Tier Agency Code	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%
PIID/FAIN	48	Awarding Office Name	Broker Extracting from FPDS-NG/FABS	7.7%	7.7%	7.7%

Source: Prepared by Kearney based upon analysis of NSF's FY 2019 Q1 File C.

APPENDIX E: MANAGEMENT'S RESPONSE**OFFICE OF BUDGET, FINANCE & AWARD MANAGEMENT****MEMORANDUM**

DATE: November 6, 2019

TO: Allison Lerner, Inspector General
[REDACTED]

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

SUBJECT: Management's Response to Official Draft, FY 2019 Performance Audit
Report on NSF's Implementation of the DATA Act

Thank you for the opportunity to respond to the official draft report provided on November 5, 2019, "FY 2019 Performance Audit Report, National Science Foundation's Implementation of the Digital Accountability and Transparency Act of 2014 (DATA Act)."¹

The National Science Foundation (NSF) agrees with the statement in the Executive Summary of the report that the majority of discrepancies found by your audit contractor, Kearney & Company (Kearney) resulted from NSF's interpretation of DATA Act reporting guidance which differed from Kearney's and your office's interpretation. While NSF management is disappointed that we were unable reach a common understanding of DATA Act guidance and technical requirements, we are pleased that after adjusting for our differing interpretations, NSF data evidences error rates of only 0.04% for completeness, 0.07% for accuracy and 1.73% for timeliness. These remarkably low error rates indicate that NSF data are of high quality.

As DATA Act Senior Accountable Official (SAO), I am confident in the quality of NSF data in light of the rigor with which my staff reviews and validates the data submission. As SAO, I review the quarterly data submissions and our noted explainable differences. I then provide reasonable assurance over the quality of NSF's submission including the required linkages between the submission files assuring that the differences are legitimate and documented and that NSF's internal controls support the reliability and validity of the agency account-level and award-level data.

¹ Kearney's performance audit was conducted over NSF's first quarter (Q1) fiscal year (FY) 2019 spending data submitted under the DATA Act.

I am further pleased that your staff has already initiated a plan to work with NSF toward next steps on resolving your concerns. Homing in on our differences and the proactive approach toward resolving them is the result of hard work of our staff and their commitment to collaborating around DATA Act stewardship. I am confident that you share my gratitude and appreciation for their work. I also want to thank Kearney for their professionalism and willingness to engage with my staff during the course of this audit.

NSF's specific analysis and response to Kearney's findings and recommendations are included in the attachment to this memo. We remain committed to the DATA Act's goals of improving financial data transparency and reducing administrative burden. NSF continues to demonstrate leadership in federal financial assistance business processes while being a dedicated community partner with an outstanding commitment to collaboratively and continuously improving, as well as clarifying government-wide standards to achieve transparency and accountability.

NSF will carefully review and consider both agency-specific and government-wide findings on the DATA Act implementation as well as your recommendations related to those findings. We look forward to the next steps and remain committed to close collaboration with your staff on these issues. If you have any questions, please do not hesitate to contact me at (703) 292-4435 or Charisse Carney-Nunes at (703) 292-5056.

Attachment

NSF Analysis and Response to Audit Findings and Recommendations

Kearney’s audit resulting in three findings and for corresponding recommendations. Finding #1 resulted in recommendation #1; finding #2 resulted in recommendation #2; and finding #3 resulted in recommendations #3 and #4.

I. Finding #1; Recommendation #1

Finding #1 found an incomplete record-level linkage between DATA Act File C (financial system data) and File D2 (award system data) accounting for approximately 99% of the errors found by Kearney. This finding resulted in one recommendation.

***Recommendation 1:** Develop and implement a methodology to ensure that NSF systems (e.g., iTRAK and Awards) reconcile or obtain an official ruling (e.g., documentation from Treasury) to validate NSF’s methodology and business process of treating File C and File D2 variances as legitimate permanent differences.*

NSF Response: NSF does not concur with this recommendation but agrees to engage Treasury to seek a common understanding of DATA Act requirements for agencies’ data submissions and looks forward to continued collaboration with the NSF OIG toward a resolution of their concerns. Specifically, NSF notes that it does not agree with Kearney’s finding that the NSF award and financial systems must reconcile exactly. NSF’s interpretation of DATA Act reporting guidance differs from Kearney’s interpretation.

NSF has received written concurrence from the Department of Treasury that DATA Act practices and procedures do not require such one-to-one matching of agency submission files, and that NSF must look to applicable guidance, i.e. the 2 CFR §200, to direct its methodology and business processes regarding File C and D2 variances as legitimate differences.

NSF disagrees with the cause relating to this finding, particularly the suggestion that the NSF Awards System be utilized as an accounting ledger and the conclusion that downward adjustments relating to financial closeout that are not reported in FABS² or D2 result in incomplete data. NSF also disagrees with the effect of the finding concluding that the transactions included in NSF’s File D2 DATA Act file submission means that USASpending.gov may not accurately reflect all NSF award actions.

The data that Kearney pulled and identified as errors are not errors but are broker warnings, which are previously disclosed as explainable differences between File C and D2. NSF data submitted to Treasury and the NSF business processes used

² FABS is an acronym for Treasury’s Financial Assistance Broker Submission system.

to record and report these financial transactions are fully in keeping with the letter and spirit of the DATA Act; in line with all applicable guidance (OMB guidance in M-17-04, Treasury PMO guidance and CIGIE audit guidance); and represent risk-based and fiscally sound practices to fulfill NSF's mission and the DATA Act goal of transparency.

NSF management conducts its activities to achieve its objectives in accordance with applicable laws, regulations and guidance. There are no requirements in law, regulation, or guidance requiring NSF to change its business processes such that every financial transaction recorded in iTRAK is also recorded in the Awards System.³

In a risk-based analysis considering costs and benefits, NSF has deemed such a change to be unnecessary, costly and a potential avenue toward increased risk. First, in an exhaustive, well-documented internal control review of NSF DATA Act processes guided by A-123, Appendix A, the agency determined that its current processes work. The agency found its data to be of high quality with a low risk of reporting inaccuracies. Next, the costs to make changes to the Awards System turning it into a *de facto* ledger would be significant. The information technology changes needed to create new fields in the Award System, develop the process flow to automatically populate those fields, and make adjustments to the DATA Act quarterly data pulls could cost multiple millions of dollars. Moreover, if NSF were to instead manually enter these transactions in the Awards System, the risk of confusing the public would actually increase because of the likelihood of human error during data entry. Additionally, the staff workload to duplicate work would tax staff to a level that could jeopardize NSF's ability to support mission achievement. Moreover, the benefits of such a change would be minimal to nonexistent because the Broker warnings would continue to exist. NSF would also receive no operational benefit from implementing such a change as award amounts are accurately maintained in iTRAK and represented on USASpending.gov.

Management has the discretion to decide how it evaluates the costs versus benefits of various approaches to ensure it is implementing effective internal controls. Although designing a one-to-one matching process as Kearney suggests in its finding is one approach, as long as NSF is following all applicable laws and regulations and has appropriately met its responsibility for meeting internal control objectives, it is entitled to choose an approach management deems is the best choice for an entity to achieve its mission. NSF demonstrates leadership in our business processes relating to federal financial assistance management, and the agency specifically points out that GAO has performed audits of NSF Grant

³ Kearney's finding is based on its opinion that "While timing differences between Files C and D2 are considered valid explanations for warnings, differences that will not reconcile are not legitimate differences." Page 19. However, NSF conducted an extensive analysis of DATA Act-related policy and technical requirements, consulting with Treasury and the Office of Management and Budget. NSF is fully compliant with all applicable standards, including but not limited to the DATA Act Statute (P.L. 113-101), Treasury Guidance on File Linkages (DAIMS v1.3.1), 2 CFR §200, Uniform Administrative Requirements and all OMB and Treasury guidance on legitimate differences.

Closeout (GAO-16-362) and DATA Act (GAO-18-138) and have not noted any areas of concern specific to the NSF and our practices.

II. Finding #2; Recommendation #2

Finding #2 found an incomplete record-level linkage between DATA Act File C (financial system data) and File D1 (procurement system data) based on a testing discrepancy where of the five PIIDs selected from File C for detailed testing, one transaction was not included within File D1. This finding resulted in one recommendation.

***Recommendation 2:** Develop and implement procedures to ensure timely review and complete reporting of the data reported to FPDS-NG, including procedures to validate the accuracy of data entered into NSF systems that interface with FPDS-NG.*

NSF Response: NSF concurs with the finding. NSF has current procedures in place to reconcile data between FPDS and iTRAK on a monthly basis and will explore options to strengthen this reconciliation and perform it in a more automated and timely fashion. NSF will also examine existing staff training and look for areas to improve training procedures to reduce the potential of human error when entering procurement transactions.

III. Finding #3; Recommendations #3 and #4

Finding #3 found inaccurate reporting of data elements within the System for Award Management (SAM) where six transactions (one PIID transaction from a sample of five and five FAIN transactions from a sample of 350) reported incomplete, inaccurate, and/or untimely information derived from SAM. This resulted in two recommendations.

***Recommendation 3:** Develop monitoring procedures to ensure that the review of all SAM-derived information is complete, accurate, and timely prior to submission to USAspending.gov. Procedures may include implementation of additional steps added to the monthly validation of FABS and FPDS-NG to ensure that the review of all derived information is complete, accurate, and timely.*

NSF Response: NSF concurs with this recommendation and does not concur with all the findings. NSF management appreciates the auditors' approach in separating government-wide reporting errors that are beyond NSF's control from errors they found attributable to the agency. NSF already performs extensive monthly validations of FABS and FPDS-NG data. The agency will explore opportunities to strengthen the validation process to account for anomalous situations and will continue to work with Treasury regarding the SAM-derived elements outside of NSF control.

Three of the six inaccuracies found by Kearney were issues between Treasury and the General Services Administration (GSA), which administers SAM, and two of the remaining three were inaccuracies due to technical browser issues from SAM screenshots. NSF's concurrences and nonconcurrences are explained below:

- a. Ultimate Parent Legal Entity Name (File D1) – NSF concurs with Kearney's finding while also noting that the data on USASpending matches with the data source (FPDS-NG) as mentioned in DAIMS v1.3. This is an issue between Treasury and GSA for deriving the data element.
- b. Awardee/Recipient Legal Entity Name and Awardee/ Recipient Unique Identifier – NSF concurs with Kearney's finding.
- c. Ultimate Parent Legal Entity Name (File D2) – NSF concurs with Kearney's finding while also noting that this is an issue between Treasury and GSA for deriving this data element from SAM.gov
- d. Ultimate Parent Unique Identifier and Ultimate Parent Legal Entity Name – NSF does not concur with Kearney's finding and specifically notes that this is not an accuracy error. The information listed on USASpending matches the data source (SAM.gov). NSF agrees that the original screenshots from SAM.gov (which is external to NSF) provided to the auditors were inaccurate due to technical issues with the browser and not the data itself. Subsequently, NSF provided screenshots that showed correct information. Hence this should not be counted as a data accuracy issue.

Recommendation 4: *Develop formal procedures to periodically review the reliability and accuracy of all data submitted by awardees/recipients within SAM.*

NSF Response: NSF does not concur with this recommendation. Awardee organizations are responsible for maintaining accurate information on SAM.gov, a system owned by GSA. DATA Act guidance states that SAM is the authoritative source for the entity name, DUNS Number and address information for the organizations registered. Per OMB guidance M-17-04, NSF relies upon GSA's assurance for SAM data and leverages the SAM database through data downloads. Additionally, NSF requires applicants to have a valid and active registration in SAM as a term and condition of the award. We check the registration status at multiple points throughout the pre-award and post-award stages during the proposal/award life-cycle, such as applicants must be registered to submit the proposal, receive an award, to have any subsequent amendment action approved or to get payment. Lastly, entities may change their SAM information at will including address, DUNS Number and other information and so it is entirely possible and expected that organization information reported by NSF from its SAM download will differ from that contained in SAM at a later point in time.

APPENDIX F: KEARNEY'S RESPONSE

Kearney & Company, P.C. (referred to as “Kearney,” “we”, and “our” in this document) appreciates the National Science Foundation’s (NSF) management’s response to the draft Digital Accountability and Transparency Act of 2014 (DATA Act) report.

The purpose and objective of the DATA Act, as directed by Congress, is to, “Expand Federal Funding Accountability and Transparency Act [FFATA] by disclosing direct agency expenditures and linking federal contract, loan, and grant spending information to federal agency programs...[and to] improve the quality of data submitted to USAspending.gov by holding agencies accountable.”⁵² Ultimately, the goal of the DATA Act is to allow the general public to understand individual agency’s expenditure data. The intent of our DATA Act performance audit was to determine whether NSF’s reported data, (Fiscal Year [FY] 2019 Quarter 1) complied with Government-wide financial data standards developed and issued by the Office of Management and Budget (OMB) and the Department of Treasury (Treasury).

Finding 1

NSF does not concur with our recommendation to develop and implement a methodology to ensure NSF systems reconcile. However, management agrees to continued collaboration and communication to seek a resolution regarding NSF’s methodology or business process of evaluating File C and File D2 variances as legitimate permanent differences. NSF states that it does not agree that the “...NSF award and financial systems must reconcile exactly.” Kearney concurs that the systems will not always be an exact “one to one match,” and agrees that valid differences due to timing may exist.

NSF additionally states that there are “no requirements in law, regulation, or guidance requiring NSF to changes its business processes such that the financial transaction recorded in iTRAK is also recorded in the Awards System.” While Kearney understands that 2 Code of Federal Regulations (CFR) 200 does not contain explicit guidance, the Federal Acquisition Regulation (FAR) does require agencies to enter all reportable contracting actions into the Federal Procurement Data System – Next Generation (FPDS-NG) (i.e., the procurement system).⁵³ Kearney interprets the intent of the guidance to result in the same reportable events for both financial assistance awards and FAR procurements. Thus, agencies should follow a process that is parallel and consistent for reconciling and reporting of all financial data, regardless of whether the financial data relates to a financial assistance award or a FAR procurement.

NSF states that the “data that Kearney pulled and identified as errors are not errors but are broker warnings, which are previously disclosed as explainable differences between File C and D2.” Kearney concurs that NSF performed an analysis over its broker warnings and explained the differences reported by the broker warnings; however, Kearney does not agree that the

⁵² <https://www.usaspending.gov/#/about>

⁵³ FAR 4.606(a)(1) states “As a minimum, agencies must report the following contract actions over the micro-purchase threshold, regardless of solicitation process used, and agencies must report any modification to these contract actions that change previously reported contract action data, regardless of dollar value:...”

differences are legitimate due to our interpretation of the guidance. For these transactions, Kearney maintains that although the agency can still complete its submission with warnings, these particular warnings represent differences that should be further reviewed and corrected or resolved at some point.

Kearney understands that NSF's business practice is to only record deobligated amounts/ downward adjustments (i.e., financial closeout transactions and transactions for post-financial close grantee adjustments) in its financial system (i.e., iTRAK) and not in its Awards Management System (Awards). NSF additionally does not deem that Awards is an accounting ledger. Kearney acknowledges this practice; however, if NSF is choosing to report data from Awards to USAspending.gov, then the information reported to the public should be complete, accurate, and timely (i.e., when an award is officially closed out administratively and financially), in accordance with the DATA Act.⁵⁴

NSF references prior Government Accountability Office (GAO) reports, specifically, Grant Closeout (GAO-16-362) and DATA Act (GAO-18-138) reports, but these reports did not contain any areas of concern specific to the NSF and its business practices. Kearney reviewed GAO-16-362 and noted that this report does not specifically address the issue of linkage between financial and awards systems, but rather, discusses grant closeout and undisbursed balance issues, and therefore, does not address the findings noted in our report. Further, Kearney reviewed the documentation provided by NSF to GAO for GAO-18-138 and noted the sample items selected were new obligation actions that would have been reported in both File C and File D2 under current NSF business processes (and therefore, would not have been identified by Kearney as a finding). It should also be noted that GAO's sample size for NSF was approximately 1% of Kearney's sample size (four [4] transactions versus 355 transactions), as the GAO sample was intended to represent the entire Federal Government, while Kearney's sample was intended to be representative of only NSF.

Kearney appreciates NSF's cooperation in developing a plan to resolve the interpretation difference of the guidance between NSF and Kearney/NSF Office of Inspector General (OIG) and looks forward to obtaining further guidance regarding the required financial reporting requirements for File D2.

Finding 3

NSF partially concurs with the recommendations provided as part of Finding 3. However, NSF disagrees with recommendation #4 in the report, in which Kearney recommends that NSF develop formal procedures to periodically review the reliability and accuracy of all data submitted by awardees/recipients within the System for Award Management (SAM or SAM.gov). NSF states that, "Awardee organizations are responsible for maintaining accurate information on SAM.gov, a system owned by GSA." However, per OMB M-18-16, "Agencies are responsible for assuring controls are in place to verify current recipient registration in SAM at the time of the financial assistance award...agencies are responsible for resolving audit findings which may indicate if recipients are not complying with their requirements to register or

⁵⁴ Public Law (P.L.) 113-101

report subawards.” NSF further states that the agency “[relies] upon GSA’s assurance for SAM data and leverages the SAM database through data downloads.” NSF should implement controls to periodically monitor awardee data in order to ensure that awardee information is accurate, complete and reliable. Kearney reiterates its recommendation that NSF should also formally develop periodic reviews to assess the reliability and accuracy of all data submitted by awardees/recipients within SAM.

APPENDIX G: ABBREVIATIONS AND ACRONYMS

Acronym	Definition
AFR	Agency Financial Report
AOAM	Agency Operations and Award Management
BFA	Office of Budget, Finance, and Award Management
Broker	DATA Act Broker
CFDA	Catalog of Federal Domestic Assistance
CFO	Chief Financial Officer
CGAC	Common Government-wide Accounting Classification
CIGIE	Council of the Inspectors General on Integrity and Efficiency
CO	Contracting Officer
DACS	Division of Acquisitions and Cooperative Support
DAIMS	DATA Act Information Model Schema V.1.1
DATA Act	Digital Accountability and Transparency Act of 2014
DGA	Division of Grants and Agreements
DQP	Data Quality Plan
ERM	Enterprise Risk Management
FABS	Financial Assistance Broker Submission
FAEC	Federal Audit Executive Council
FAIN	Federal Award Identification Number
FAR	Federal Acquisition Regulation
FFATA	Federal Funding Accountability and Transparency Act of 2006
FISMA	Federal Information Security Management Act of 2002
FMFIA	Federal Managers' Financial Integrity Act of 1982
FPDS-NG	Federal Procurement Data System – Next Generation
FSRS	FFATA Sub-award Reporting System
FY	Fiscal Year
GAGAS	Generally Accepted Government Auditing Standards
GAO	Government Accountability Office
GSA	General Services Administration
GTAS	Government-wide Treasury Account Symbol Adjusted Trial Balance System
Guide	Inspectors General Guide to Compliance under the DATA Act
ID	Identification
IDD	Interface Definition Document
IG	Inspector General
IT	Information Technology
Kearney	Kearney & Company, P.C.
MD&A	Management Discussion and Analysis
MPM	Management Procedures Memorandum
MREFC	Major Research Equipment and Facility Construction
NAICS	North American Industrial Classification System
NSB	National Science Board
NSF	National Science Foundation
OIG	Office of Inspector General
OMB	Office of Management and Budget
PIID	Procurement Instrument Identifier
PL	Public Law
PMO	Program Management Office
Q1	First Quarter
Q2	Second Quarter

Acronym	Definition
Q4	Fourth Quarter
R&RA	Research and Related Activities
SAM	System for Award Management
SAO	Senior Accountable Official
SE	Service Enablement
SF	Standard Form
TAFS	Treasury Account Fund Symbol
TAS	Treasury Account Symbol
Treasury	Department of the Treasury
TRS	Telecommunications Relay Service
URI	Unique Record Identifier

APPENDIX H: CIGIE'S DATA ACT ANOMALY LETTER

December 22, 2015

The Honorable Ron Johnson
Chairman
The Honorable Thomas Carper
Ranking Member
Committee on Homeland Security
and Governmental Affairs
United States Senate
Washington, D.C.

The Honorable Jason Chaffetz
Chairman
The Honorable Elijah Cummings
Ranking Member
Committee on Oversight and Government Reform
U.S. House of Representatives
Washington, D.C.

Dear Mr. Chairmen and Ranking Members:

The Council of the Inspectors General on Integrity and Efficiency (CIGIE) recognizes and appreciates your leadership on issues of Government transparency and accountability. In particular, we believe the enactment last year of the Digital Accountability and Transparency Act of 2014 (DATA Act) will significantly improve the quality of Federal spending data available to Congress, the public, and the accountability community if properly implemented. To make sure this happens, the DATA Act provides for strong oversight by way of the Federal Inspectors General and the Government Accountability Office (GAO). In particular, the DATA Act requires a series of reports from each to include, among other things, an assessment of the completeness, timeliness, quality, and accuracy of data submitted by agencies under the DATA Act.

I am writing this letter on behalf of CIGIE to inform you of an important timing anomaly with the oversight requirement for Inspectors General in the DATA Act. Your staffs have been briefed on this timing anomaly, which affects the first Inspector General reports required by the DATA Act. Specifically, the first Inspector General reports are due to Congress in November 2016. However, the agencies we oversee are not required to submit spending data in compliance with the DATA Act until May 2017. As a result, Inspectors General would be unable to report on the spending data submitted under the Act, as this data will not exist until the following year. This anomaly would cause the body of reports submitted by the Inspectors General in November 2016 to be of minimal use to the public, the Congress, the Executive Branch, and others.

To address this reporting date anomaly, the Inspectors General plan to provide Congress with their first required reports in November 2017, a one-year delay from the due date in statute, with subsequent reports following on a two-year cycle, in November 2019 and November 2021. We believe that moving the due dates back one year will enable the Inspectors General to meet the

1717 H Street, NW, Suite 825, Washington, DC 20006

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intent of the oversight provisions in the DATA Act and provide useful reports for the public, the Congress, the Executive Branch, and others.

Although we think the best course of action is to delay the Inspector General reports, CIGIE is encouraging the Federal Inspector General Community to undertake DATA Act “readiness reviews” at their respective agencies well in advance of the first November 2017 report. Through a working group, CIGIE has developed guidance for these reviews. I am pleased to report that several Inspectors General have already begun reviews at their respective agencies, and many Inspectors General are planning to begin reviews in the near future. We believe that these reviews, which are in addition to the specific oversight requirements of the Act, will assist all parties in helping to ensure the success of the DATA Act implementation.

We have kept GAO officials informed about our plan to delay the first Inspector General reports for one year, which they are comfortable with, and our ongoing efforts to help ensure early engagement through Inspector General readiness reviews.

Should you or your staffs have any questions about our approach or other aspects of our collective DATA Act oversight activities, please do not hesitate to contact me at (202) 514-3435.

Sincerely,



Michael E. Horowitz
Chair, Council of the Inspectors General on Integrity and Efficiency
Inspector General, U.S. Department of Justice

cc: The Honorable David Mader, Controller, OMB
The Honorable Gene Dodaro, Comptroller General, GAO

APPENDIX I: DATA ACT RELATED CRITERIA

The following section includes the criteria utilized to develop our findings noted in the **Findings** section within the body of the report.

Public Law (P.L.) 109-282 – Sept 26, 2006, FFATA, Section 2, *Full Disclosure of Entities Receiving Federal Funding*, states the following:

- (2) FEDERAL AWARD.—The term “Federal award”—
 - (A) means Federal financial assistance and expenditures that—
 - (i) include grants, subgrants, loans, awards, cooperative agreements, and other forms of financial assistance;
 - (ii) include contracts, subcontracts, purchase orders, task orders, and delivery orders...

According to P.L. 113-101 – May 9, 2014, DATA Act, Section 2, *Purposes*:

The purposes of this Act are to –

- (1) Expand the Federal Funding Accountability and Transparency Act of 2006 by disclosing direct Federal agency expenditures and linking Federal contract, loan, and grant spending information to programs of Federal agencies to enable taxpayers and policy makers to track Federal spending more effectively;
- (2) establish Government-wide data standards for financial data and provide consistent, reliable, and searchable Government-wide spending data that is displayed accurately for taxpayers and policy makers on USAspending.gov (or a successor system that displays the data)...
- (4) improve the quality of data submitted to USAspending.gov by holding Federal agencies accountable for the completeness and accuracy of the data submitted...

The Federal Acquisition Regulation (FAR) Subpart 4.1103, *Procedures, System for Award Management*, states the following:

- (b) If the contract action is being awarded in accordance with policy, the contractor is required to be registered in SAM within 30 days after the contract award, or at least three days prior to submission of the first invoice, whichever occurs first.
- (c) Agencies shall protect against improper disclosure of information contained in SAM.
- (d) The contracting officer shall, on contractual documents transmitted to the payment office, provide the unique entity identifier, or, if applicable, the Electronic Funds Transfer indicator, in accordance with agency procedures.

The FAR Subpart 4.604, *Responsibilities, reporting of Contractual actions to FPDS-NG*, states the following:

- a. The Senior Procurement Executive in coordination with the head of the contracting activity is responsible for developing and monitoring a process to ensure timely and accurate reporting of contractual actions in FPDS[-NG]
- b. (1) The responsibility for the completion and accuracy of the individual contract action report (CAR) resides with the contracting officer who awarded the contract action. CARs in a draft or error status in FPDS[-NG] are not considered complete.
(2) The CAR must be confirmed for accuracy by the contracting officer prior to release of the contract award. The CAR must then be completed in FPDS[-NG] within three business days after the contract award.

According to Code of Federal Regulations (CFR), Title 2: *Grants and Agreements*, Part 25.200: *Requirements for Program Announcements, Regulations, and Application Instructions*: “To remain registered in the SAM database after the initial registration, the applicant is required to review and update on an annual basis from the data of the initial registration or subsequent updates its information in the SAM database to ensure it is current, accurate, and complete.”

CFR, Title 2: *Grants and Agreements*, Part 25.205: “Effect of Noncompliance with a Requirement to Obtain to Unique Entity Identifier or Register in the SAM,” states the following:

- (a) An agency may not make an award to an entity until the entity has complied with the requirements described in 25.200 to provide a valid unique entity identifier and maintain an active SAM registration with current information
- (b) At the time an agency is ready to make an award, if the intended recipient has not complied with an applicable requirement to provide a unique entity identifier or maintain an active SAM registration with current information, the agency:
 - (1) May determine that the applicant is not qualified to receive an award, and
 - (2) May use the determination as a basis for making an award to another applicant.

According to OMB M-17-04, *Additional Guidance for DATA Act Implementation: Further Requirements for Reporting and Assuring Data Reliability*, Section 3, *Quarterly SAO Assurance over DATA Act Data*:

Agency's SAO assurance will be submitted quarterly through the forthcoming DATA Act Broker process. The quarterly process will require the SAO to assure the following:

The alignment among the Files A-F is valid and reliable. Since a DATA Act submission contains a combination of many data sets, the SAO will be required to attest to the validity and reliability of the complete DATA Act submission, including the interconnectivity/linkages (e.g. award ID linkage) across all the data in files A, B, C, D, E, and F. Where there are legitimate differences between files, the SAO should have categorical explanations for misalignments. To provide this assurance, agencies should have internal controls in place over all of the data reported for display USAspending.gov per A-123.

The data in each DATA Act file submitted for display on USAspending.gov are valid and reliable. To provide this assurance, the SAO will confirm that internal controls over data quality mechanisms are in place for the data submitted in DATA Act files. Existing data quality measures required by regulation and/or OMB guidance will be sufficient for SAO reliance on individual data files.

OMB M-18-16, Appendix A to OMB Circular No. A-123, *Management of Reporting and Data Integrity Risk, Footnote 3* states the following:

...Additionally, consistent with terms and conditions of Federal awards, entities receiving Federal awards are required by 2 C.F.R. Part 25 and the FAR to submit accurate data to SAM and the FFATA Subaward Reporting System (FSRS) maintained by the General Services Administration (GSA). The quality of this data is the legal responsibility of the recipient. GSA provides an assurance statement that the systems are maintained appropriately and can therefore be used for public reporting. Agencies are responsible for assuring controls are in place to verify current recipient registration in SAM at the time of the financial assistance award. Pursuant to 2 C.F.R. Part 200.513, agencies are responsible for resolving audit findings which may indicate if recipients are not complying with their requirements to register or report subawards.

According to GAO-14-704G, Standards for Internal Control in the Federal Government, September 2014, Section 13.05, *Data Processed into Quality Information*:

Management processes the obtained data into quality information that supports the internal control system. This involves processing data into information and then evaluating the processed information so that it is quality information. Quality information meets the identified information requirements when relevant data from reliable sources are used. Quality information is appropriate, current, complete, accurate, accessible, and provided on a timely basis. Management considers these characteristics as well as the information processing objectives in evaluating processed information and makes revisions when necessary so that the information is quality information.

DATA Act Information Model Schema (DAIMS) v1.3.1, Section 1.3.4 states: “TransactionObligatedAmount: File C should include all award IDs with each TransactionObligatedAmount that occurred during the quarter, so that the financial information can be compared to File D1/D2 in aggregate at the award ID level.”

DAIMS v1.3.1, Appendix D, *FAQ & Examples Related to File C TOA*, states the following:

For the Transaction Obligated Amounts in File C, the goal or intent is to have corresponding and linking obligation transactions in File D. This means that File C must only report new obligations incurred, upward modifications to obligations, and downward modifications/de-obligations. These would be transactions in the obligation series of USSGL Accounts: 4801, 4802, 4831, 4832, 4871, 4872, 4881, 4882, 4901, 4902, 4908, 4931, 4971, 4972, 4981, and 4982. However, transactions that net out or wash out in the Status of Resources must be excluded.

7. Question: How will the comparison in the validation reports of obligations on the C File to obligations on the D1 and D2 files be done?

Answer: For each unique award ID in File C, the sum of each TOA reported for the period should match the sum of the FederalActionObligation amounts reported in D1 or D2 for the same timeframe, regardless of modifications. Due to timing and other issues, the amounts may not match and only a warning message will be included in the validation report (see validation rule #C23 on the help page of the Broker).

According to the Council of the Inspectors General on Integrity and Efficiency (CIGIE) Federal Audit Executive Council (FAEC) Inspectors General Guide to Compliance under the DATA Act, February 2019, Section 200.05, *Planning*: “Files A, B, and C are submitted by Federal agencies from their internal financial system(s). Files A and B are summary-level financial data. File C is reportable record-level data. Files D1 through F contain detailed information for record level transactions reported in File C.”

CIGIE FAEC Inspectors General Guide to Compliance under the DATA Act, February 2019, Section 570.03, *Test Detailed Record-Level Linkages for Files C and D*, states:

Audit teams should confirm that all financial assistance awards in the sample selected from File C match the FAIN or URI contained in File D2... Any variances identified by the auditors between Files C and D2 should be clearly explained and documented by the Federal agency. The audit team should assess the reasonableness of the agency's explanation and resolution of all variances and report on any unusual or unexplained variances it identifies.

According to the CIGIE FAEC Inspectors General Guide to Compliance under the DATA Act, February 2019, Section 580.05, *Test Detailed Record-Level Data Elements for Files C and D*:

[Question]: If a transaction is correctly recorded in File C, but data elements are not in File D1/D2 then do we consider those data elements to be inaccurate?

[Answer]: Statistically those data elements must be considered inaccurate. In order to determine the error rate, you must have an answer to the question of whether the data element is accurate (Yes or No) or not applicable. File C items are considered "recorded" and each record is a sample unit. Therefore, if a transaction is correctly recorded in File C, but File D1/D2 data elements are not included, then those File D1/D2 data elements are incomplete, inaccurate, and untimely...

NSF's Data Quality Plan (DQP) states the following:

- Objectives of Internal Control Over DATA Act Reporting: Internal control over quarterly DATA Act reporting is a process designed to provide reasonable assurance regarding the accuracy of DATA Act reporting of the 57 requisite elements and that the reporting process is reliable and valid. Reliability and validity of DATA Act reporting means that management can reasonably make the following assertions:
 - All spending transactions that should be reported for the quarter have been included and all non-reportable transactions are excluded (completeness).
 - Reportable spending transactions and key data elements agree to NSF systems of record (accuracy). The systems of record are:
 - Official contract file for procurement related elements,
 - ITRAK for financial related elements, and
 - Award System and E-Jacket for financial assistance related elements.
 - Reportable spending transactions are reported in a timely manner (timeliness).
 - Spending data is reported in compliance with the objectives of the DATA Act (compliance).



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