



OFFICE OF INSPECTOR GENERAL U.S. Department of Energy



Management Challenges at the Department of Energy — Fiscal Year 2023

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Department of Energy
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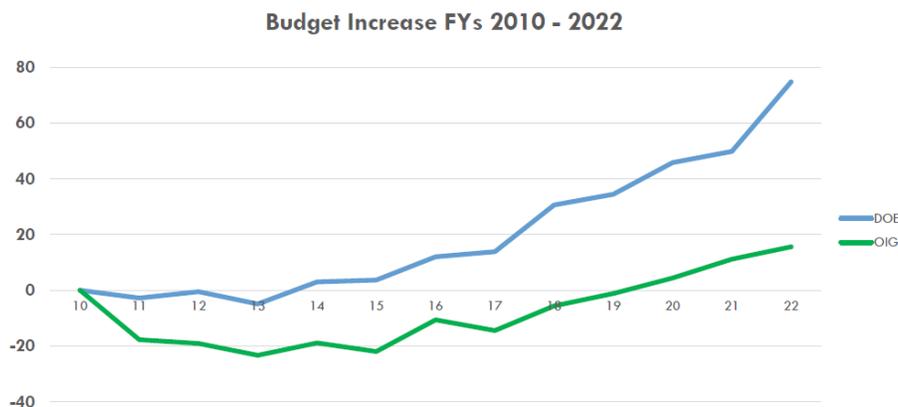
MEMORANDUM FOR THE SECRETARY OF ENERGY

SUBJECT: INFORMATION: Special Report on Management Challenges at the Department of Energy — Fiscal Year 2023

These are historic and unprecedented times at the Department of Energy. As you know, the Department will grow from managing a \$45.3 billion budget in fiscal year 2022 to managing over \$100 billion of appropriated funds and \$336 billion in loan authorities under the Infrastructure Investment and Jobs Act and the Inflation Reduction Act. The CHIPS and Science Act has authorized but not yet appropriated an additional \$30.5 billion. While these funds will be expended over a period of years, almost \$54 billion has already been received by the Department, and another \$13 billion will be appropriated to the Department during this fiscal year.

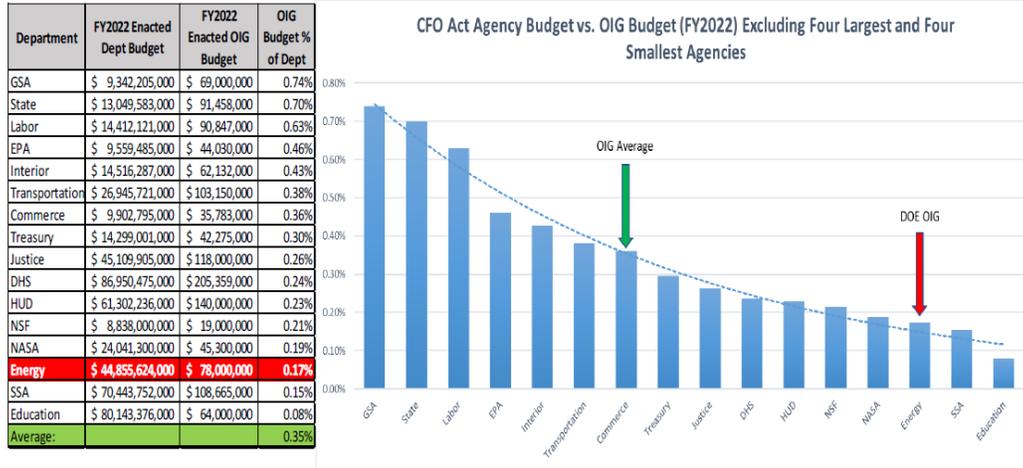
These massive spending bills create enormous challenges for management. Two critical questions must be addressed at the outset. First: Do these spending bills allow the Department to create an appropriately sized oversight infrastructure to ensure that these funds are delivered as Congress intended? As our report discusses in more detail, the Department has a procurement and acquisition workforce that, historically, has been underfunded and understaffed as compared to other Federal agencies. We noted that the Infrastructure Investment and Jobs Act caps administrative expenditures at 3 percent, which is not sufficient to cover both the administrative costs to get the money “out the door” and the costs for the Department to provide effective oversight of new and expanding programs.

The second critical question: Do these massive spending bills allow the Department’s Office of Inspector General (OIG) to execute its statutory obligations to protect these funds? The OIG has been, and continues to be, severely underfunded. The following chart demonstrates the decline of OIG funding with respect to the growth of the Department’s budget.



The next chart provides a glance of Inspector General funding for all the Chief Financial Officers (CFO) Act agencies as of fiscal year 2022.

Federal CFO Act Agency Budget vs. OIG Budget Comparison
 Numbers are FY2022 enacted based on FY2022 Conference Report



The next two charts demonstrate the continuing dilution of funding available for the Department’s OIG as result of the Infrastructure Investment and Jobs Act and the Inflation Reduction Act.

	IJA Agency Funding	IJA OIG Funding	OIG Percent of Agency Funding
EPA	\$61billion	\$269 million	0.44%
HHS	\$4 billion	\$17 million	0.44%
DOI	\$28 billion	\$99 million	0.35%
USDA	\$8 billion	\$27 million	0.34%
DHS	\$8 billion	\$20 million	0.25%
DOE	\$64 billion	\$62 million	0.10%

	IRA Agency Funding	IRA OIG Funding	OIG Percent of Agency Funding
DOE	\$44.28 billion	\$20 million	0.05%
DOI	\$6.65 billion	\$10 million	0.15%

This continued and compounded dilution of OIG funding will result in insufficient oversight of both existing programs and the more than 50 newly established programs. Without the OIG receiving additional funding, critical areas such as research security, clean energy, grid deployment, scientific computing, stockpile stewardship, environmental cleanup, and pit production, to name a few, will not receive appropriate OIG oversight. Moreover, the OIG will not be able to provide the near-term audit and inspection assistance that the President has specifically requested to minimize the longer-term impacts from the large-scale frauds that often plague Federal programs providing such funding on a rapid timeline.

As you know, I am currently working with Congress and the Office of Management and Budget to correct this underfunding problem for the OIG. Thank you again for your support as we enter such a challenging and exciting time at the Department.



Teri L. Donaldson
Inspector General

cc: Deputy Secretary
Chief of Staff
Under Secretary for Science and Innovation
Principal Deputy Under Secretary for Infrastructure
Under Secretary for Nuclear Security and Administrator, National Nuclear Security Administration
Chief Information Officer
Deputy Chief Financial Officer

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Management Challenges at the Department of Energy — Fiscal Year 2023 At a Glance

What Are Management Challenges?

In accordance with the Reports Consolidation Act of 2000, the Office of Inspector General (OIG) reports annually on the most serious management challenges facing the Department of Energy. The management challenges process is an important tool for focusing the Department's finite resources on its most significant risks and vulnerabilities.

The Department's Mission

The Department's mission is to support the Nation's prosperity by addressing its climate, energy, environmental, and nuclear security challenges through transformative science and technology solutions. Through 17 national laboratories, the Department engages in cutting-edge research that expands the frontiers of scientific knowledge, generates new technologies to address the country's greatest energy challenges, and strengthens national security by maintaining and modernizing the nuclear stockpile. In fiscal year (FY) 2022, the Department had an annual appropriation of approximately \$46 billion, and through the passing of two major pieces of legislation, additional funds of nearly \$100 billion were appropriated. These new laws also add an additional \$336 billion of loan related authority, expanding the Department's authority to \$350 billion.

What the OIG Did

This year, in coordination with Department mission elements, we updated the challenges previously identified in FY 2022 and identified the new authorizations and appropriations under the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and the Inflation Reduction Act as raising enormous new challenges for the Department.

What the OIG Identified

Based on our work over the past year, the FY 2022 management challenges have been updated to show progress and we added a new challenge for FY 2023. These challenges include:

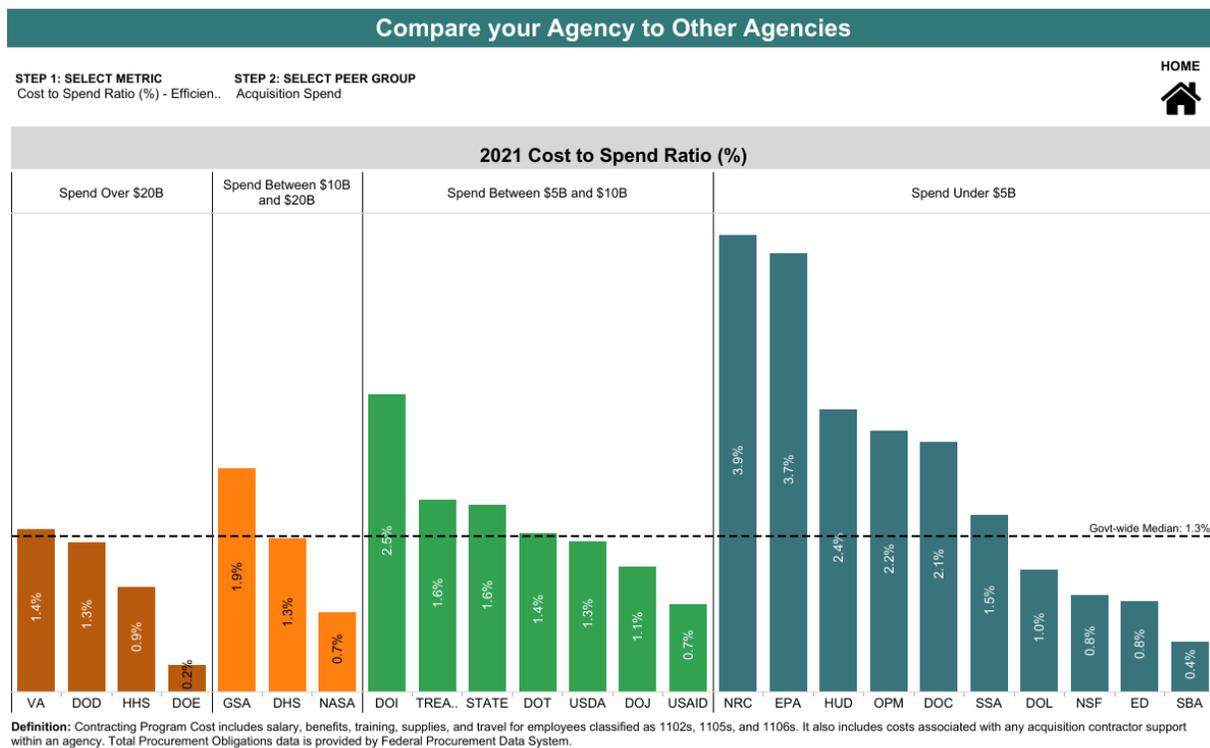
- I. Cross-Cutting Challenges — Reducing Fraud, Waste, and Abuse
 - Implementing Effective Oversight of Expenditures under the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and the Inflation Reduction Act
 - Using All Available Tools to Combat the Theft of Intellectual Property — Research Security
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- II. Key Mission Element Challenges
 - National Nuclear Security Administration — Restoring Plutonium Pit Production Capability
 - Office of Environmental Management — Managing Tank Waste
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CROSS-CUTTING CHALLENGES — REDUCING FRAUD, WASTE, AND ABUSE

Office of Inspector General

As the largest civilian contracting agency in the Federal Government, the Department of Energy spends approximately 90 percent of its annual budget on contracts to operate its scientific laboratories, engineering and production facilities, and environmental restoration sites.

These contracts are overseen by a Department procurement and acquisition workforce that, historically, has been underfunded and understaffed as compared to other Federal agencies. To illustrate, the Office of Management and Budget performed a comparison of Federal acquisition workforce costs to contract spending for Federal agencies and demonstrated that the Department of Energy has the smallest acquisition workforce oversight ratios by far — a 0.2 percent rate of acquisition workforce per contract dollars in the Department as compared to the next lowest peer agency with 0.9 percent rate.



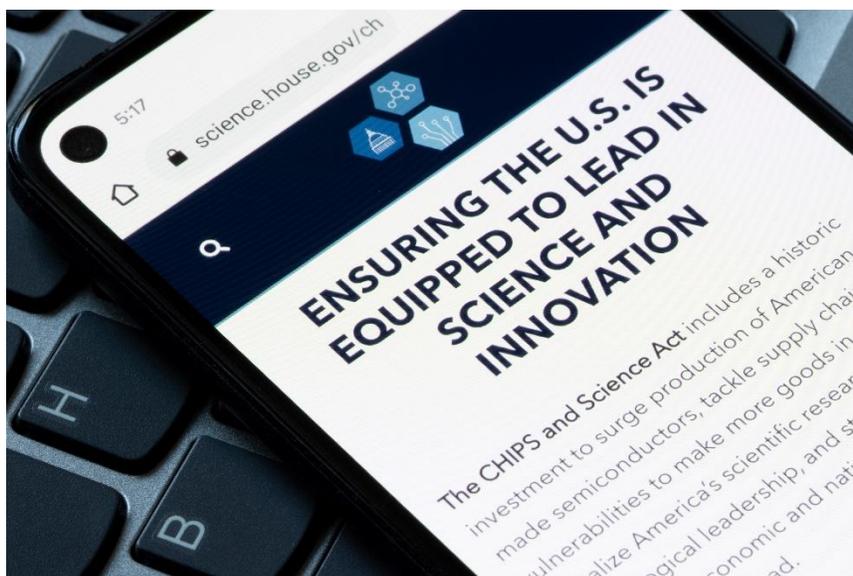
Source: <https://d2d.gsa.gov/report/benchmarking-initiative>

This comparison was performed prior to the Department receiving an unprecedented influx of funds through the passage of the Infrastructure Investment and Jobs Act (IIJA), the CHIPS and

Science Act (CHIPS Act), and the Inflation Reduction Act (IRA). The additional funding will inevitably strain the existing administration and oversight structure as the Department ramps up its management of these funds in compliance with Congress’ directives.

Due to Department reliance on contractors to execute much of its mission and the dramatic increase in funding, the Office of Inspector General (OIG) continues to focus and strengthen its efforts on cross-cutting management challenges to modernize and improve Department oversight of its contractors. Realizing improvements within these areas will help protect the Department from fraud, waste, and abuse.

Implementing Effective Oversight of Expenditures under the IIJA, the CHIPS Act, and IRA



“Of course, more than simply passing laws, success depends on effective implementation. That means the Department of Energy’s work is just beginning.”

– Jennifer M. Granholm,
Secretary of Energy

Photo courtesy of Shutterstock.com, 2022

Significance of the Issue

For context, the Department’s Combined Statements of Budgetary Resources reports a total of \$53.8 billion in budgetary resources for FY 2021.¹ With the enactment of three major new funding laws in FY 2022, the Department is facing major risks associated with creating new programs and rapidly expanding existing programs.

¹ https://www.energy.gov/sites/default/files/2021-11/fy-2021-doe-agency-financial-report_0.pdf

- IJA² appropriated \$62.5 billion, over 5 years, for clean energy demonstration projects; energy efficiency and renewable energy programs; grid reliability and electrical transmission projects; fossil energy and carbon management projects; credits for continued civilian nuclear power production; and other programs.
- The CHIPS Act³ authorized an additional \$30.5 billion, over 5 years, to the Department for Office of Science projects, research and development, and additional science and innovation priorities.
- IRA⁴ appropriated \$35.2 billion to support home energy rebate programs; projects to decrease greenhouse gasses in industrial facilities; numerous projects in energy programs; and, most importantly, a major expansion of the Department’s direct loans and loan guarantee program by funding credit subsidies and administration costs for the Department’s Loan Program Office.
- Each of these new laws greatly expand the Department’s loan authorities—after adding the expanded loan authority to existing loan authorities, the sum of loan and loan guarantee authority is expected to approach \$350 billion.

Challenges

The scale and magnitude of these new spending and loan programs introduce a greatly increased risk of fraud, waste, and mismanagement. The OIG has recently issued a series of reports⁵ that draw from prior OIG and United States (U.S.) Government Accountability Office reports to assist Department leadership to identify and correct potential shortfalls in several of the existing Department programs impacted by the new legislation. Common themes and risk discussed in these reports include:

- Insufficient Federal staffing and oversight of projects at the transaction level. The Department has a long history of insufficient staffing to oversee its contractors and financial assistance awards. The OIG has encouraged Department leadership to reserve resources to provide sufficient oversight over these new and expanding programs.
- Inadequate internal controls and policies and procedures at both the Federal level and recipient level. We noted inadequate controls to include basic accounting controls and

² Public Law 117-58

³ Public Law 117-167

⁴ Public Law 117-169

⁵ <https://www.energy.gov/ig/articles/special-report-doe-oig-22-40>

<https://www.energy.gov/ig/articles/special-report-doe-oig-22-39>

<https://www.energy.gov/ig/articles/special-report-doe-oig-22-34>

<https://www.energy.gov/ig/articles/special-report-doe-oig-22-30>

financial systems in place to adequately segregate and accumulate costs, as well as inadequate controls to select contractors, grantees, subcontractors, and subrecipients.

- Circumvention of project controls that were put into place to mitigate technical and financial risks.
- Potential conflicts of interest and undue influence.
- Problems associated with compliance with contract and grant terms and conditions, such as the Davis-Bacon Act, competitive contracting, domestic sourcing, management of interest on advanced funds, reporting and other requirements.
- Inadequate acceptance of completed work including problems with substandard work, billing errors, unapproved work order changes, unperformed or undocumented final inspections, and charges for unsupported costs.

These risks are compounded by the fact that this major increase in spending and lending under the new legislation will be overseen by a Department procurement and acquisition workforce that has been historically underfunded and understaffed. We noted that IJA caps administrative expenditures at 3 percent, which may be highly problematic given that the Department is already underfunded and given that the new expenditures under IJA include both near-term and longer-term expenditures. It appears that substantial dollars may be moving under IJA through the Department before an appropriately sized oversight infrastructure is implemented. The Department is currently evaluating whether it may have additional flexibility under the CHIPS Act and IRA to implement a more robust oversight infrastructure. In FY 2022, the Department has already obligated approximately \$1.057 billion of IJA funds and will begin to accelerate spending in FY 2023.

It is imperative that Department leadership recognize the immense risks associated with these new and expanded programs and take assertive steps to mitigate the risks. The OIG has identified a need for Department leadership to identify and set aside sufficient resources for full Federal program staffing, as well as sufficient resources to build robust internal controls and independent oversight systems to prevent and detect problems to ensure the Government and taxpayers are protected.

Department officials have informed the OIG that the Department is taking steps to improve its fraud prevention and detection controls, interagency collaboration, project management, and technical assistance, among other things.

This area will likely remain a major management challenge for the foreseeable future.

Using All Available Tools to Combat the Theft of Intellectual Property — Research Security

“I wish to note that intellectual property theft by a government represents the very essence of organized crime.”

– Howard Berman,
Former U.S. House of
Representatives



Photo courtesy of Shutterstock, 2022

Significance of the Issue

As reported in the FY 2021 Agency Financial Report, the Department supported \$14.4 billion in total research and development.⁶ The risks associated with the theft of intellectual property will only increase as the Department invests heavily utilizing some of the newly authorized and appropriated funds under IIJA, the CHIPS Act, and IRA. While some of this work is for fundamental research that is freely published in public, much of it is subject to intellectual property protections and/or national security considerations. This major investment remains a target for foreign governments seeking to illicitly acquire access to U.S.-funded research efforts. This is particularly troubling given the Department’s integral role in the development and maintenance of nuclear weapons systems, along with other pivotal national security missions. The economic and scientific value of the research and intellectual property developed within the Department’s complex has led foreign governments and their proxies to intensify efforts to extract information from the Department’s institutions.

Department Progress

Since our prior Management Challenges report, the Department’s Research Security and Integrity Policy Working Group has drafted a new conflict of interest policy, released via a Financial Assistance Letter, which emphasizes combating financial conflicts of interest among Department-funded researchers. The Department has also begun work on a new conflict of commitment policy which seeks to address the same concerns for non-financial, overlapping

⁶ <https://www.energy.gov/cfo/articles/fy-2021-doe-agency-financial-report>

commitments from multiple institutions that will help enhance integrity among our grantees. The Department has begun to demonstrate a commitment to preventing theft of its intellectual property by instituting prohibitions on affiliation with foreign talent programs from countries of concern for all prospective IJJA funding recipients, and by signaling it will widen such restrictions to all financial assistance recipients for future funding opportunity announcements. The Department also seeks to finalize required disclosures for the current and pending grantees.

Challenges

While some efforts are underway as described above, the Department must prioritize these efforts, complete these and other tasks, and ensure that it has adequate tools and resources to effectively prevent theft of intellectual property. At the same time, these tools must be designed with sufficient clarity to facilitate timely investigations and prosecutions of individuals violating the laws intended to protect this research. For example, the challenge remains in FY 2023 for the Department to fully implement National Security Presidential Memorandum 33 by creating a standardized set of required certifications and disclosures for all funding applicants. This is especially important given the significant increase in grant funds allocated under IJJA, the CHIPS Act, and IRA. The Department must also closely monitor the effective implementation of Department directives restricting employees and contractors from affiliating with any foreign state-sponsored programs from identified countries of concern.

Aside from such affiliations, the Department must also design requirements to deter and penalize individuals who have stolen valuable intellectual property owned by the U.S. and transported that property to our adversaries.

Modernizing Oversight by Continuing to Access Systems and Data for the Purpose of Running Data Analytics

“With data collection, ‘the sooner the better’ is always the best answer.”

– Marissa Mayer,
Co-Founder Lumi Labs, former
President and CEO, Yahoo!



Photo courtesy of Shutterstock, 2022

Significance of the Issue

The potential use of data analytics could save the taxpayers substantial funds and improve efficiency and oversight. In March 2020, the Payment Integrity Information Act of 2019 was enacted and incorporated select provisions from the Fraud Reduction and Data Analytics Act of 2015, the Improper Payments Information Act of 2002, the Improper Payments Elimination and Recovery Act of 2010, and the Improper Payments Elimination and Recovery Improvement Act of 2012 into a single subchapter in the U.S. Code. To comply with the Payment Integrity Information Act of 2019, the Department has undertaken the development and implementation of a Fraud Risk and Data Analytics Framework (Framework). The significance of the potential use of data analytics within the Department cannot be overstated. For example, the use of data analytics would improve effective and efficient management and oversight of the significant influx of funds associated with IJA, the CHIPS Act, and IRA.

Department Progress

Although much work remains, the Department has taken some steps towards establishing and implementing the Framework. Officials have defined the Framework and its placement within the organization and established a leadership hierarchy to guide the effort. To assist in the continued Framework implementation, the Department established a Senior Assessment Team to provide a leadership role in reviewing the Department’s fraud risk profile and direct mitigation strategies with the support of the Data Analytics Working Group.

The Department also formed a Fraud Risk Working Group that supports preparation of the annual agency fraud risk register and fraud risk profile. The working group developed a fraud risk register based on reported fraud risks, fraud risk occurrences, and internal control entity assessment data. The register was then prioritized to prepare the Department's Fraud Risk Profile, which was approved by the Senior Assessment Team and the Senior Oversight Council, the Departmental Internal Control, and the Assessment Review Council. The Department's Fraud Risk Profile was issued in June 2022 by the Chief Risk Officer and Deputy Chief Financial Officer and identifies the Department's most significant risks for focusing data analytic efforts.

The Department's Data Analytics Working Group also established collaboration with field and contractor staff to identify contractor conflicts of interest and available data sets that could be used as pilots for data analytic purposes. Data analytic activities have also been incorporated into the internal control program and the payment integrity program to more efficiently and effectively track and trend data for overseeing and monitoring internal controls, improper payments, and possible fraud. The Department recognizes the need to expand training in data analytics, and aside from continuing to upskill the workforce in this area internally, the Department is also leveraging the Chief Financial Officer Council's Workforce Modernization Working Group's data analytics pilot cohort training program for several participating personnel.

The Department is also developing a Planning, Programming, Budgeting, and Execution process (i.e., multi-year budgeting) that includes consideration of the Department's most significant risks. The Planning, Programming, Budgeting, and Execution process will be a data-driven, resource-allocation process to apply leadership priorities, provide transparency, and direct resources to mitigate risks. The Department proposes to further enhance its Antifraud Strategy by linking Department fraud risks to organizational risks and considering mitigation actions from risk owners and supporting offices to annually update the Department's Fraud Risk Profile and identify newly confirmed fraudulent activities.

As part of the Department's Governance, Risk, and Compliance Project that was implemented within the financial management system, Standard Accounting and Reporting System, analytics are utilized to monitor financial transactional data and identify business process exceptions. Analytics through the Governance, Risk, and Compliance Project can provide the Department with the ability to identify business process breakdowns, as well as manage and remediate exceptions. Remediation of exceptions should improve data quality and reduce fraud.

Challenges

As noted in our prior Management Challenges report, an immediate challenge complicating Department implementation of the Framework is its limited oversight resources, including limited personnel with the associated skill sets needed to operate a data analytics program. All

the planning in the world will not substitute for having a properly sized and properly trained workforce to implement data analytics.

Another significant challenge the Department faces is identifying the data systems and the sources used by the Department and its contractors. The Office of the Chief Financial Officer is currently documenting the current data analytics being performed by Department elements and the data systems in use. Even when these systems are identified, the Department may encounter challenges accessing data, especially for systems managed by its contractors.

On an independent track, the OIG continues to move forward with its use of data analytics. The OIG uses data analytics to conduct risk assessments and to support ongoing audits, inspections, and investigations. In the near-term, the OIG data analytics team will continue to focus on two goals: (1) to identify and access critical data contained in relevant Federal and contractor systems, and (2) to analyze high-risk areas such as labor, pay, grants, subcontracts, and contract charges.

The OIG's use of data analytics will help to alleviate many of the historical issues associated with delays in receiving data and will ensure the integrity and completeness of data. Notably, direct read-only access to information is the most effective and efficient way to use data analytics to identify fraud, waste, and abuse in real time. Real time, or near-immediate, detection of fraud is the most powerful use of data analytics.

Improving Audits of Costs Incurred and Claimed



“Never take your eyes off the cash flow because it’s the lifeblood of business.”

– Sir Richard Branson

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Shutterstock.com, 2022

In our prior Management Challenges report, we discussed the results of the OIG’s multi-year effort to evaluate the Cooperative Audit Strategy. The culmination of these efforts resulted in an OIG Special Project Report, *The Transition to Independent Audits of Management and Operating Contractors’ Annual Statement of Costs Incurred and Claimed* (DOE-OIG-21-26, April 2021), which identified significant findings demonstrating that the Cooperative Audit Strategy was not functioning as intended. Since that time, the OIG has worked cooperatively with the Department and Management and Operating (M&O) contractors to begin implementing the independent audit strategy, under which the OIG will conduct, or arrange for, independent incurred cost audits for 23 M&O contractors across the Department enterprise. The OIG’s independent audit effort is designed to correct the Cooperative Audit Strategy and restore independence to these audits. In FY 2022, the OIG received an additional appropriation of \$18 million to perform the incurred cost audits. The OIG has hired 30 auditors to date and has partnered with both the Defense Contract Audit Agency and other independent audit organizations to launch the new incurred cost audit program.

The Department has also taken steps to transition to independent audits by modifying major contracts and updating its policy guidance documents. Additionally, the Department is in the process of preparing updated language for the Department of Energy Acquisition Regulation. The Department has taken steps to standardize the incurred cost submission to comply with the Federal Acquisition Regulation (FAR). In standardizing the required incurred cost submission to conform with FAR, several M&O contractors have asked for and received extensions to the timeframes for submissions. Given this is the first year the submissions are being developed in

this new format, some challenges and delays were anticipated; however, it is important that the Department enforce the timeframes established in FAR to ensure that incurred cost audits may be performed in a timely manner.

The Department is ultimately responsible to ensure that the \$24 billion spent annually by M&O contractors represent costs that are reasonable, allocable, and allowable in supporting the mission of the Department. While the OIG will independently audit these expenditures, the OIG is not an internal control that may be cited to reduce or diminish the Department's primary oversight responsibilities. Because the Department has made substantial progress implementing an independent audit strategy, we anticipate that this issue will no longer appear in future Management Challenges reports.

Building a Stronger Suspension and Debarment Program

“There are risks and costs to action. But they are far less than the long range risks of comfortable inaction.”

– John F. Kennedy



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Having a robust suspension and debarment program is crucial for the Department’s operations and to promote the integrity of governmental contracting, and other transactions. For context, the Department’s Combined Statements of Budgetary Resources reports a total of \$53.8 billion in budgetary resources for FY 2021⁷ to be used for contracting for services and supplies, acquiring assets, or making grants and other transactions. During the first three quarters of FY 2022, the Department obligated more than \$41 billion in the same categories.⁸ IIJA, the CHIPS Act, and IRA will substantially increase these figures.

In our prior Management Challenges report, we identified an opportunity to improve suspension and debarment processes at the Department. Suspension and debarment are the primary means the Government uses to mitigate risk from parties that have shown themselves not to be responsible participants in Federal procurements, grants, agreements, programs, and transactions. While these remedies typically rely upon criminal convictions or serious civil offenses, Suspension and Debarment Officials may impose these exclusions whenever evidence indicates that the individual or company is not presently responsible and, therefore, presents a risk to Federal programs and operations.

The prior Management Challenges report notes that other Federal agencies with a smaller contracting presence operate robust suspension and debarment programs. Previous reports also

⁷ https://www.energy.gov/sites/default/files/2021-11/fy-2021-doe-agency-financial-report_0.pdf

⁸ Based on [USASpending.gov](https://www.usaspending.gov) agency-specific detail reviewed in August 2022.

looked at Department of Defense actions for proportionate comparison. The number of actions taken by these comparators are:⁹

Agency	2019		2020	
	Suspension	Debarment	Suspension	Debarment
General Services Agency	49	84	15	60
Department of Housing and Urban Development	40	97	23	33
Department of Defense	267	442	137	484
Department of Energy	3	11	8	9

To assist the Department in improving its record, the OIG enhanced its capabilities regarding suspension and debarment referrals and updated its procedures in October 2021. The early reviews and streamlined referrals sought to identify evidence and produce an actionable referral as early and efficiently as possible. In the following months, the OIG completed its initial operational training cycle and enhanced the forms for our referral packages.

The OIG has now institutionalized the process of referring judicially based suspension and debarment activities. The OIG’s emphasis on identification and preparation of referrals has enabled the OIG to increase the number of referrals to the Department. Specifically, in FY 2020, the OIG made 7 suspension and debarment referrals, while the number increased to 18 in FY 2021 and increased to 29 in FY 2022.¹⁰

Given the increase in suspension and debarment referrals, some challenges and delays were anticipated. The Department should, however, establish a timeframe, such as 30 calendar days, within which it will issue a first notice or otherwise act on an OIG suspension or debarment referral.¹¹ The OIG looks forward to continuing to work with the Department to ensure that Suspending and Debarring Officials have the evidence they need in time to protect the Government with appropriate exclusions.

⁹ All numbers listed come from the Interagency Suspension and Debarment Committee reports at <https://www.acquisition.gov/isdc-reporting> (last accessed September 20, 2022).

¹⁰ Two of the referrals, which used the Nonprocurement Suspension and Debarment Rule in Title 2 Code of Federal Regulations § 180, recommend that the Suspending and Debarring Official issue a suspension while the debarment is pending. Under Interagency Suspension and Debarment Committee counting conventions, the OIG counts the debarment and suspension elements of those referrals separately.

¹¹ Action in this context would include declining to suspend or debar. The Department’s Suspending and Debarring Officials clearly have the prerogative not to issue an exclusion in response to an OIG referral.

Enforcing the Mandatory Disclosure Rule



“The time is always right to do what is right.”

– Martin Luther King, Jr.

Photo courtesy of Shutterstock.com, 2022

Given Department reliance on contractors to execute its mission, it is imperative that Department contractors conduct business operations with integrity. For this reason, FAR requires contractors’ internal programs to include an ethics and compliance system with practices aimed at preventing and detecting misconduct and promoting an organizational culture that encourages ethical conduct and a commitment to compliance with the law. Contractors who conduct work for the Department must establish and maintain an Employee Concerns Program suitable for the organization to accept, process, and resolve employee concerns related, but not limited to, fraud, waste, and abuse. A critical feature of this compliance strategy is FAR’s Mandatory Disclosure Rule (MDR).

The MDR requires a Federal contractor to disclose to the OIG in a timely manner, in writing, whenever the contractor has credible evidence of violations of Federal criminal law involving fraud, conflict of interest, bribery, gratuity violations, or violations of the civil False Claims Act.

In July 2020, the OIG initiated inspections to determine how contractors have been managing specific employee concerns that trigger MDR requirements. The OIG reviewed the results of these inspections and discovered significant lapses in reporting. Those lapses included numerous cases in which the contractors documented credible evidence of potential violations of Federal criminal law or the civil False Claims Act but did not disclose these matters to the OIG. Even where the contractors engaged outside counsel to handle an inquiry, or took remedial action against an employee, contractors failed to report the cases to the OIG, as required.

The contractors' failure to report these issues denied us the opportunity to conduct timely, independent investigations. Timely, independent investigations are crucial to procurement integrity. Such violations of the MDR may expose the Department to additional fraud, waste, and abuse.

In FY 2023, the Department should ensure that the contractors report mandatory disclosures in accordance with the rule. To assist with this, the OIG is working to improve the reporting mechanism for MDRs by developing a consistent, electronic means to report, and by developing instructions and examples related to the reporting requirement.

KEY MISSION ELEMENT CHALLENGES

*National Nuclear Security Administration
Office of Environmental Management
Artificial Intelligence and Technology Office*

National Nuclear Security Administration — Restoring Plutonium Pit Production Capability



“The nuclear security enterprise is at its busiest since the Cold War and our ability to innovate and accelerate delivery is front and center in all our programs.”

– Jill Hruby,
Under Secretary for
Nuclear Security
Administrator, National
Nuclear Security
Administration (NNSA)

The Plutonium Facility at Los Alamos, with the Rio Grande Valley and the Sangre de Cristo Mountains in the background. (Photo courtesy of Los Alamos National Laboratory, <https://creativecommons.org/licenses/by-nc-nd/2.0/legalcode>)

Significance of the Issue

NNSA is responsible for maintaining a safe, secure, reliable, and effective nuclear weapons stockpile. Plutonium pits are a vital component in all U.S. nuclear weapons. During the Cold War, the Nation produced more than 1,000 plutonium pits per year (PPY) at the Rocky Flats Plant in Colorado. Since the closure of the Rocky Flats Plant in 1992, the U.S. has lacked the capability to produce significant quantities of new plutonium pits.

Maintaining confidence in the nuclear warheads that compose our Nation’s nuclear deterrent requires the Department to re-establish a plutonium pit manufacturing capability. Newly manufactured pits are required to improve warhead safety and security, mitigate the risk of

confidence in the deterrent posed by plutonium/pit aging, and support potential changes to future warheads due to threats posed to the U.S. nuclear deterrent from renewed peer competition.

Department Progress

The Department works closely with the Department of Defense to meet the requirement of manufacturing no fewer than 80 war reserve (WR) PPY as close to 2030 as technically and economically feasible. To achieve this manufacturing capacity, the Department implemented a two-site solution with the objective of producing 30 WR PPY at Los Alamos National Laboratory (LANL) at the existing Plutonium Facility-4, while also producing 50 WR PPY at the Savannah River Site's (SRS) facility previously referred to as the Mixed Oxide Fuel Fabrication Facility. Both facilities already meet the stringent building design standards necessary to support pit manufacturing; however, only the facility located at LANL is currently capable of producing plutonium pits. The Department's assessment continues to be that utilizing two facilities is the most effective approach in terms of schedule, cost, and meeting the 80 WR PPY deliverable. Additionally, the two-site approach provides the needed resilience against unplanned outages, particularly important for implementing production capacity.

Major capital acquisition projects at both sites achieved key milestones in FY 2021 and FY 2022. At LANL, in April 2021, the Los Alamos Plutonium Pit Production Project (LAP4) achieved Critical Decision (CD)-1, Approve Alternate Selection and Cost Range; in November 2021, the LAP4 subproject, Decontamination and Decommissioning, achieved CD-2/3, Approve Performance Baseline and Start of Construction, for demolition activities that make room for the installation of new production equipment; and CD-3A and CD-3B authorizing long lead procurements for gloveboxes and process equipment were approved. Work has begun on developing the 90 percent design package to manufacture and install the 30 Base subproject production equipment, and the CD-2 package is expected in the first quarter of FY 2023. At SRS, in June 2021, the Savannah River Plutonium Processing Facility (SRPPF) Project achieved CD-1, and the project is maturing the design and refining costs and schedule estimates to support CD-2 in FY 2025.

Based on the 30 percent design, which includes complete information from the LAP4 and SRPPF CD-1 submissions, the Department assessed that achieving rate production of 30 PPY at LANL is achievable.

However, the Department has determined that producing 50 PPY by 2030 at SRS to meet the overall 80 PPY objective is not achievable. The SRPPF assessment is based on considerations that to produce WR pits¹² at the required rate necessitates successful completion of the following three activities: (1) completing SRPPF construction and receiving startup authorization (CD-4);

¹² WR pits have been certified to meet the stringent quality assurance requirements necessary to enter the U.S. nuclear weapons stockpile.

(2) demonstrating a WR-quality pit manufacturing capability; and (3) demonstrating the ability to manufacture at full rate capacity while maintaining WR quality control. The first key activity is expected to be completed in the CD-1 approved schedule range from the first quarter of FY 2032 through the fourth quarter of FY 2035.

As the SRPPF design matures, the Department will continue exploring all available options to accelerate the project to reach CD-4 as early as possible within the CD-1 approved time range. The total time duration for achieving the last two key activities is several years based on past and current experience. The Department plans to utilize information from the SRPPF CD-2 package; leverage ongoing work at LANL and Lawrence Livermore National Laboratory to minimize the time required for demonstrating WR manufacturing capacity; and apply lessons learned from LANL as it ramps up rate production to refine and establish the target date for CD-4, while achieving 50 WR PPY at SRS. In addition, the Department anticipates the delivery of the SRPPF CD-2 package in FY 2024, which will include two implementation schedules developed with information obtained from LANL and Lawrence Livermore National Laboratory based on prior experience manufacturing pits at LANL. The two implementation schedules will include: (1) a plan for meeting 50 WR PPY as soon as possible, and (2) a plan emphasizing the reduction of overall risk in meeting the schedule. This approach will provide options for the Nation's decision makers on how to proceed with the implementation of the SRPPF.

Challenges

To meet these production objectives, the Department faces challenges associated with staffing and the construction and modernization of LANL and SRS facilities. The Department must develop and maintain an expert workforce of sufficient size and quality to meet the challenging and changing needs of new processes, prototype demonstrations, capacity production, and the building of special items to support the project.

Office of Environmental Management — Managing Tank Waste



“Our nuclear programs have left behind two things: an environmental legacy, and a sacred obligation — an obligation to ensure the air, the water, and the communities surrounding our programs are safe, and that the families in those communities can thrive.”

– Jennifer M. Granholm,
Secretary of Energy

Canisters of Waste at the Defense Waste Processing Facility at the Savannah River Site (Source: [DWPF Canisters](#) | [DWPF Canisters](#) | [Savannah River Site](#) | [Flickr](#) License Link: [Creative Commons — Attribution 2.0 Generic — CC BY 2.0](#))

Significance of the Issue

The Department’s Office of Environmental Management (Environmental Management) is responsible for addressing the environmental legacy of decades of nuclear weapons production and Government-sponsored nuclear energy research. This mission includes the safe, effective, and cost-efficient management, treatment, and disposition of waste (i.e., “tank waste”) generated through legacy-spent nuclear fuel reprocessing and other plutonium processing activities. Environmental Management manages a total inventory of approximately 92 million gallons of tank waste, which is a primary environmental risk at most sites where it is located. At the Hanford Site (Hanford), SRS, and the Idaho National Laboratory Site (INL), the remaining tank waste is stored in aging underground tanks.

In addition to environmental risks, tank waste represents a significant financial burden to the U.S. Government. The Department is the top contributor to the Federal Government’s overall environmental liabilities, with Environmental Management’s current total environmental liability approximately \$406 billion in 2021 constant dollars according to the Department’s FY 2021 Agency Financial Report. As such, the Department expends significant resources to manage this tank waste safely and effectively.

Department Progress

The Department is currently engaged in a major effort to construct and commission complex, first-of-its-kind, multi-billion-dollar facilities to treat tank waste.

The Department initiated hot commissioning of the Salt Waste Processing Facility (SWPF) at SRS in October 2020 and began full operations of the facility in January 2021. Since the introduction of radioactive salt waste to the SWPF, it has processed over 3 million gallons of salt waste. As the SWPF increases efficiency and optimizes its operations, process rates of up to 6 million gallons annually are projected with current technologies.

At INL, the Department completed a confirmatory run, using waste simulant to assess readiness for radiological operations of the Integrated Waste Treatment Unit (IWTU), which will treat remaining liquid tank waste. The Department anticipates the IWTU will be operational during the second quarter of FY 2023 with waste treatment expected to take from 5 to 7 years to complete.

At the Hanford Waste Treatment and Immobilization Plant (WTP), the Analytical Laboratory is ready to support commissioning of the Low-Activity Waste Facility. Additionally, the Department has completed construction of the Hanford WTP's Low-Activity Waste Facility. Startup testing was completed in November 2021 and heat-up of the first of two melters at the WTP was initiated in October 2022. Cold commissioning is scheduled to begin in FY 2023 to support commencement of radiological operations. In January 2022, the Department initiated the first large-scale treatment of tank waste at Hanford with the startup of the Tank Side Cesium Removal system, which removes radioactive cesium and undissolved solids from the tank waste in preparation for vitrification at the Low-Activity Waste Facility under the Direct Feed Low-Activity Waste (DFLAW) approach. To date, approximately 380,000 gallons of tank waste have been processed by the Tank Side Cesium Removal system.

Along with ensuring the completion and commissioning of the necessary tank waste treatment facilities, the Department has instituted new policies and approaches that have the potential to open new disposition pathways for tank waste. In FY 2019, the Department issued its interpretation of the statutory term, "high-level radioactive waste" as defined in the Atomic Energy Act of 1954, as amended, and the Nuclear Waste Policy Act of 1982, as amended. This interpretation represents a science-driven approach to managing tank waste via its radioactive characteristics, not by how the waste was generated. The high-level radioactive waste (HLW) interpretation could enable the Department to manage and dispose of tank waste in a risk-based and more cost-effective manner that remains fully protective of human health and the environment more appropriately. The first application of the HLW interpretation was completed with public participation in September 2020 with 8 gallons of SRS Defense Waste Processing Facility recycle wastewater shipped to the Waste Control Specialists LLC's low-level radioactive waste disposal facility in Andrews, Texas. Secretary Granholm committed to assessing the

HLW interpretation during her Congressional confirmation hearing in January 2021. This assessment, which was completed in December 2021,¹³ affirmed that the HLW interpretation is consistent with the law, the best available science and data, and the recommendations of the Blue-Ribbon Commission on America’s Nuclear Future. In developing the HLW interpretation, the views of members of the public and the scientific community were considered. The Department is currently in the process of evaluating a second waste stream (i.e., contaminated process equipment) at SRS for potential disposal at a licensed commercial facility under the HLW interpretation. The Department will not use the HLW interpretation without prior meaningful consultation with stakeholders and regulators. Any decisions about whether and how the interpretation would apply to other wastes at any site would be the subject of subsequent actions using a robust public engagement process.

Challenges

The safe and efficient management and disposition of tank waste will require the Department’s sustained commitment and leadership. While progress has been made in establishing its capabilities to treat tank waste for final disposition, significant work remains. At Hanford, the Department will need to complete start-up and commissioning of those facilities involved in the DFLAW approach. The Low-Activity Waste Vitrification facility is estimated to treat approximately one-third of the low-activity inventory of tank waste. The DFLAW approach will treat approximately 1 million gallons yearly. The Department will need to identify and select additional treatment options to fully address Hanford’s remaining low-activity inventory. A study to support that effort is being conducted by the Federally Funded Research and Development Center National Academies of Sciences, Engineering and Medicine, under Section 3125 of the National Defense Authorization Act for Fiscal Year 2021. Additionally, the Department needs to identify and develop technically achievable, cost-effective, and viable approaches for treating the high-activity inventory of tank waste at Hanford for disposition. The current program of record calls for the WTP’s Pretreatment and High-Level Waste facilities to prepare and vitrify the high-level waste for eventual final disposition. However, construction work on those facilities was suspended to resolve technical issues. Analyses performed by the Department and the Army Corps of Engineers determined that it is unlikely that the Department will complete the Pretreatment and High-Level Waste facilities and begin operation in time to meet current commitments. Currently, the Department is finalizing an Analysis of Alternatives and is conducting holistic negotiations with the State of Washington Department of Ecology on potential options for treating high-level tank waste as efficiently as possible.

At SRS, the Department will need to continue improving the DWPF’s and SWPF’s long-term reliability and availability. When the Next Generation Solvent is implemented at the SWPF, it

¹³ Assessment of Department of Energy’s Interpretation of the Definition of High-Level Radioactive Waste, a Notice by the Department on December 21, 2021, 86 Federal Register 72220, available at <https://www.federalregister.gov/documents/2021/12/21/2021-27555/assessment-of-department-of-energys-interpretation-of-the-definition-of-high-level-radioactive-waste>

will enable processing greater than the 6 million gallons of waste per year capability provided by the original solvent. To complete the bulk of the tank waste mission at SRS in the next decade, the Department will need effective management of the spent nuclear fuel processing mission at the Savannah River H-Canyon facility, which contributes to the site's tank waste mission.

At INL, the Department completed a confirmatory run using waste simulant to assess readiness for radiological operations of the IWTU, which will treat the remaining liquid tank waste. Following the readiness assessments, the IWTU will undergo inspections and decontamination system testing in preparation for the targeted start of radiological operations. Finally, the Department will need a pathway for the disposal of the calcined material currently stored at INL.

Artificial Intelligence and Technology Office — Establishing the Department as a Federal Enterprise Leader in Developing and Deploying Artificial Intelligence



Photo courtesy of Shutterstock.com, 2022

“Artificial intelligence presents a new frontier for enhancing our economic and national security, as well as our way of life.”

– Don Graves,
Deputy Secretary, U.S.
Department of Commerce

Significance of the Issue

In February 2019, the President directed the Department and other Federal agencies to pursue strategic objectives to promote and protect American advancements in Artificial Intelligence (AI). These objectives include, among others: sustained investment in AI research and development (R&D) in collaboration with industry; enhanced access to high-quality and fully traceable Federal data, models, and computing resources; and minimized vulnerability to AI-enabled attacks from malicious actors. Maintaining American leadership in AI will require a “whole-of-government approach” that will include meaningful contributions from Department and other Federal agencies working in partnership with experts in the private and academic sectors. In particular, the Executive Order on *Maintaining American Leadership in Artificial Intelligence* states:

Maintaining American leadership in AI requires a concerted effort to promote advancements in technology and innovation, while protecting American technology, economic and national security, civil liberties, privacy, and American values and enhancing international and industry collaboration with foreign partners and allies.

As highlighted in our Management Challenges reports dating back to November 2020, AI has the potential to transform many aspects of discovery and applied technology science; manufacturing,

infrastructure, finance, and commerce; Government operations; and national security. As the custodians of the most advanced high-performance supercomputers and massive multimodal data sets stemming from diverse research, the Department and its national laboratories are well-situated to work in conjunction and take a leading role in developing and deploying AI. For instance, the Department's Summit supercomputer at the Oak Ridge National Laboratory, which has unsurpassed AI capabilities, played an important role in COVID-19 investigations of the virus and potential therapeutic responses. Moreover, because the Department is charged with wide-ranging and complex missions in environmental stewardship, energy infrastructure, and national security, the deployment of advanced AI technologies is vital to enhancing its operations and resisting threats from the adversarial use of AI.

Department Progress

The Department has made progress related to its AI efforts in recent years. For example, the Secretary of Energy established the Artificial Intelligence and Technology Office (AITO) in September 2019 to foster the strategic coordination and development of AI capabilities across the Department by serving as the central point of coordination for the broad and extensive capabilities of the Department and its national laboratory complex. Since then, various progress has been made, including a number of immediate collaborations that were leveraged as pillars for the development of the Department's AI Strategy, partnerships with the intelligence community, improved relationships and joint workshops with the national laboratories, and identification of cross-cutting challenges coordinated and led by the AITO on behalf of program offices.

The AITO also announced the Department's establishment of the inaugural Artificial Intelligence Advancement Council, a first-of-its-kind at the Department, to coordinate strategic research priorities and ensure investment decisions are effectively leveraged. Further, the AITO coordinated the development of the *Department of Energy Artificial Intelligence Strategy FY 2022 – FY 2025* in partnership with 15 program offices, 11 laboratories, the Western Area Power Administration, the Chief Research Officer, the Advanced Scientific Computing Research program, and NNSA. The AITO also issued its *FY22 Program Plan and FY23 Forecast*, which includes various goals, activities, and key outcomes to be accomplished in FY 2022.

Achieving the ambitious goal of establishing the Department as a leader among Federal agencies in developing and deploying AI technology will require well-coordinated initiatives, including focused cross-cutting investments. As such, the AITO has been active with efforts sponsored by the White House and is the responsible AI Official, guiding the Department toward conformance with Executive Order 13960, *Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government*, that involves implementation planning, and if necessary, retirement of systems.

The AITO is also an active member of the Equity AI Interagency Policy Committee and the Interagency Task Force on Military and Veteran's Mental Health. The AITO has been

instrumental in forming cross-cutting, global collaborations to showcase national laboratory AI initiatives, solving challenges that further the mission of the administration, and amplifying awareness and use of research to further the Department's mission. For example, the Department's Exascale Computing Project, a collaboration among six national laboratories, is working to bring the next generation of world-leading, AI-optimized supercomputers online along with mission-critical applications that will effectively use these systems.

Challenges

While progress has been made by the Department related to its AI efforts, many challenges remain that could impact the Department's goals of being a leader in AI R&D. For instance, realizing the Department's goal of AI leadership will require cross-cutting and enterprise-wide efforts with contributions from diverse elements such as the AITO; the Office of Science; the Office of Cybersecurity, Energy Security, and Emergency Response; the Office of the Chief Information Officer; Department national laboratories; and NNSA. Achieving success in such a collaborative effort is inherently challenging.

The Department's investment in AI R&D and demonstration has been largely fragmented. Efforts have been made by various Department elements drawing on their respective resources for research or operations, but these resources are not dedicated exclusively to AI. Therefore, AI investment must compete with other important initiatives sharing the same resource pools. These other important initiatives include quantum information science and the Exascale Computing Initiative. While investments in these other initiatives may also further AI development, the benefits to AI are often incidental to the primary purpose of the projects. Likewise, some of the Department's investments in cybersecurity R&D encompass elements of AI technology, but not exclusively. Such a fragmented approach to AI investment poses the risk that the Department will miss opportunities to leverage all its resources strategically.

Additionally, the Department's full potential as a leader in AI will be realized only if it develops and deploys the technology in a wide range of its missions. For example, opportunities exist for the Department to deploy advanced AI technology to enhance the defense of the agency and the security of the electric grid through the development of surrogate models, to improve operations of the national laboratory system, to protect infrastructure against cyberthreats, to monitor financial records, and to detect potential waste or improper billings by Department contractors. Identifying and making investments in cross-cutting AI opportunities that do not fall solely within the arena of a single program may also benefit Department elements and stakeholders. However, the effectiveness of this approach may be limited by resources.

Finally, the Department identified various gaps that could impact its ability to effectively achieve AI goals. The gaps focused around five major themes, including the impacts associated with Department mission applications; AI techniques and fundamentals needed to advance the mission; AI requirements for disaster response and resiliency; opportunities for AI in supporting

the Department’s critical infrastructure; and the ethical framework needed to support Department researchers. By addressing gaps in these areas, the Department should be in a better position to advance science and technology, and automate the mechanisms that facilitate discovery, critical infrastructure, sustainable environmental management, future scientific facilities, security, scaling, and deployment.

In summary, while the Department plans to continue addressing and mitigating the challenges associated with AI, doing so requires expanded investments in AI research and workforce development, resources and support of the AITO, ongoing support to sustain AI software and tools developed in the Exascale Computing Initiative, and identification and coordination of cross-cutting AI R&D projects. Meeting these goals will require a coherent, enterprise-wide strategy, excellent intradepartmental collaboration, and large-scale investments.

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