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Washington, DC 20548

Comptroller General
of the United States

May 25, 2023

The Honorable Jennifer M. Granholm
Secretary
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

Priority Open Recommendations: Department of Energy

Dear Secretary Granholm,

The purpose of this letter is to provide an update on the overall status of the Department of Energy's (DOE) implementation of GAO's recommendations and to call your continued personal attention to areas where open recommendations should be given high priority.¹ In November 2022, we reported that, on a government-wide basis, 77 percent of our recommendations made 4 years ago were implemented.² DOE's recommendation implementation rate was 59 percent. As of April 2023, DOE had 216 open recommendations. Fully implementing these open recommendations could significantly improve agency operations.

Since our June 2022 letter, DOE has implemented six of our 26 open priority recommendations, and we removed the priority status from one recommendation.

- DOE completed its analysis of options for handling excess space at the Strategic Petroleum Reserve after congressionally mandated sales are complete. These options included decommissioning, selling, and increasing commercial activity at idled sites. This analysis meets the intent of our May 2018 recommendation.³
- DOE's Office of Environmental Management (EM) has developed a program-wide strategy across the EM complex to enable EM to better direct available resources where necessary. In 2022, EM published a Program Plan outlining a roadmap for the cleanup program. EM has also developed and updated a Strategic Vision over the last 3 years,

¹Priority recommendations are those that GAO believes warrant priority attention from heads of key departments or agencies. They are highlighted because, upon implementation, they may significantly improve government operations, for example, by realizing large dollar savings; eliminating mismanagement, fraud, and abuse; or making progress toward addressing a high-risk or duplication issue.

²GAO, *Performance and Accountability Report: Fiscal Year 2022*, [GAO-23-900398](#) (Washington, D.C.: Nov. 15, 2022).

³GAO, *Strategic Petroleum Reserve: DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile*, [GAO-18-477](#) (Washington, D.C.: May 30, 2018).

which provides a high-level summary of EM's priorities and progress over the decade ahead. These actions meet the intent of our January 2019 recommendation.⁴

- DOE approved its National Transuranic Program Recovery Planning Guide, which addresses how DOE would handle an interruption to waste disposal operations, including mitigating potential impacts, at the Waste Isolation Pilot Plant, as we recommended in November 2020.⁵
- A DOE-convened Federally Funded Research and Development Center published the first volume of results from its ongoing review of options for treating and disposing of supplemental low-activity waste at the Hanford Site. This report describes DOE's analysis of potential disposal options for grouted low-activity waste, including off-site options outside the state of Washington, as we recommended in December 2021.⁶
- DOE signed a policy memo applicable to all DOE projects subject to DOE's Project Management Order 413.3B. That memo requires that any project doing a root cause analysis after a baseline change develop a corrective action plan. The memo also requires DOE's Office of Project Management to assess and validate the extent to which corrective actions resolve root causes. The memo indicates that these changes will be included in the next update of Order 413.3B.⁷ These actions meet the intent of two March 2022 recommendations.
- We determined that one open recommendation related to improving the National Nuclear Security Administration's (NNSA) Office of Defense Programs' program execution instruction no longer warrants priority attention. NNSA has partially addressed that recommendation and plans to undertake actions to fully implement the recommendation when it next revises the relevant agency guidance.⁸

We ask for your continued attention to the remaining 19 priority recommendations. We are also adding eleven new recommendations related to improving project, program, portfolio, and contract management; addressing nuclear modernization challenges; addressing DOE's environmental and disposal liabilities; and addressing insider threats and cybersecurity. This brings the total number of priority recommendations to 30. (See the enclosure for the list of the recommendations).

⁴GAO, *Department of Energy: Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability*, [GAO-19-28](#) (Washington, D.C.: Jan. 29, 2019).

⁵GAO, *Nuclear Waste Disposal: Better Planning Needed to Avoid Potential Disruptions at Waste Isolation Pilot Plant*, [GAO-21-48](#) (Washington, D.C.: Nov. 19, 2020).

⁶GAO, *Nuclear Waste Disposal: Actions Needed to Enable DOE Decision That Could Save Tens of Billions of Dollars*, [GAO-22-104365](#) (Washington, D.C.: Dec. 9, 2021).

⁷GAO, *Waste Isolation Pilot Plant: Construction Challenges Highlight the Need for DOE to Address Root Causes*, [GAO-22-105057](#) (Washington, D.C.: Mar. 15, 2022).

⁸See GAO, *Nuclear Weapons: NNSA Should Further Develop Cost, Schedule, and Risk Information for the W87-1 Warhead Program*, [GAO-20-703](#) (Washington, D.C.: Sept. 9, 2020)

The 30 open priority recommendations fall into the following seven areas:

Improving project, program, and portfolio management. Historically, DOE has struggled with managing programs and projects, including mitigating the risks of uncontrolled changes to scope, cost, and schedule; failure to meet goals; and increasing environmental liabilities. Implementing our six priority recommendations in this area, such as following best practices in its analysis for waste pretreatment at the Hanford site and establishing an enterprise-wide portfolio management framework, would improve DOE's management of its major projects and programs.

Improving contract management. Contract management is one of the highest risks that the government faces. Aspects of DOE's contract management and administration are on GAO's [High-Risk List](#). By implementing our three priority recommendations—including that it assess and document inherent fraud risks and identify gaps and strategies related to its acquisition workforce—DOE will better oversee and manage its contractors.

Enhancing energy reliability, security, and resilience. U.S. energy infrastructure, including the electricity grid, faces risks from climate change that can affect the nation's economic and national security. By implementing our four priority recommendations, including establishing a plan to guide the agency's efforts to develop tools for resilience planning and developing and implementing strategy to enhance the resilience of the electricity grid to climate risks, DOE could enhance the nation's energy reliability, security, and resilience.

Addressing nuclear modernization challenges. NNSA is undergoing an ambitious, decades-long, and costly effort to modernize the nation's nuclear security enterprise. Implementing our three priority recommendations, such as developing an integrated master schedule for plutonium pit production that meets best practices would help NNSA address challenges to this effort.

Addressing DOE's environmental and disposal liability. The federal government's environmental liability—another area on our [High Risk List](#)—has been growing for the past 20 years and is likely to continue to increase. DOE is responsible for \$520 billion of the \$626 billion in liability reported for fiscal year 2022.⁹ By implementing our three priority recommendations, including continuing its efforts to engage the public and finalize its draft consent-based siting process to identify sites to store or permanently dispose of spent nuclear fuel and high-level radioactive waste, DOE could reduce the cleanup costs that contribute to its environmental liability.

Addressing insider threats and cybersecurity. Recent high-profile disclosures of classified information and cyberattacks targeting public and private components of the nation's critical infrastructure highlight the urgent need to address insider threats in federal agencies cybersecurity weaknesses in the energy sector. Implementing two priority recommendations for insider threats, such as better integrating and centrally managing insider threat responsibilities, would improve DOE's ability to identify insider risks before an incident occurs. Additionally, implementing seven priority recommendations, such as consulting with sector partners to develop a cybersecurity framework and developing a cybersecurity risk management strategy, would improve DOE's efforts to manage cybersecurity risks. Because DOE is the sector risk

⁹Department of the Treasury, *Financial Report of the United States Government Fiscal Year 2022* (Washington, D.C.: February 2023).

management agency for the energy sector, we urge you to implement our priority recommendation related to coordinating with the Department of Homeland Security and other relevant stakeholders to develop a plan for implementing the federal cybersecurity strategy for the electric grid.

Addressing worker protections. Under federal laws, regulations, and DOE policies, contractors generally must maintain an open environment for raising safety or other concerns without fear of reprisal. DOE has repeatedly recognized that the contractor employees who carry out the bulk of its mission-related work are an important source of information about potential quality and safety issues at DOE sites. Implementing our two priority recommendations, such as revising policy and guidance and addressing program deficiencies, would improve DOE's ability to protect DOE and contract workers from unlawful retaliation and sexual harassment.

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In April 2023, we issued our biennial update to our [High Risk List](#). This list identifies government operations with greater vulnerabilities to fraud, waste, abuse, and mismanagement. It also identifies the need for transformation to address economy, efficiency, or effectiveness challenges.¹⁰ Two of our high-risk areas—[acquisition and program management for DOE's National Nuclear Security Administration and Office of Environmental Management](#) and [U.S. government's environmental liability](#)—focus largely on DOE.

Several other government-wide, high-risk areas also have direct implications for DOE and its operations. These include (1) [improving the management of IT acquisitions and operations](#), (2) [strategic human capital management](#), (3) [managing federal real property](#), (4) [ensuring the cybersecurity of the nation](#),¹¹ and (5) [government-wide personnel security clearance process](#). We urge your attention to these government-wide, high-risk issues as they relate to DOE. Progress on high-risk issues has been possible through the concerted actions and efforts of Congress, the Office of Management and Budget (OMB), and the leadership and staff in agencies, including DOE. In March 2022, we issued a report on key practices to successfully address high-risk areas, which can be a helpful resource as your agency continues to make progress to address high-risk issues.¹²

In addition to your continued attention on these issues, we recognize the key role Congress plays in providing oversight and maintaining focus on our recommendations to ensure they are implemented and produce their desired results. Legislation enacted in December 2022 included a provision for GAO to include any congressional oversight actions that can help agencies

¹⁰GAO, *High-Risk Series: Efforts Made to Achieve Progress Need to be Maintained and Expanded to Fully Address All Areas*, [GAO-23-106203](#) (Washington, D.C.: Apr. 20, 2023).

¹¹With regard to cybersecurity, we also urge you to use foundational information and communications technology supply chain risk management practices set forth in our December 2020 report, *GAO, Information Technology: Federal Agencies Need to Take Urgent Action to Manage Supply Chain Risks*, [GAO-21-171](#) (Washington, D.C.: Dec. 15, 2020).

¹²GAO, *High-Risk Series: Key Practices to Successfully Address High-Risk Areas and Remove Them from the List*, [GAO-22-105184](#) (Washington, D.C.: Mar. 3, 2022).

implement priority recommendations and address any underlying issues relating to such implementation.¹³

There are various strategies Congress can use in addressing our recommendations, such as incorporating them into legislation. Congress can also use its budget, appropriations, and oversight processes to incentivize executive branch agencies to act on our recommendations and monitor their progress. For example, Congress can hold hearings focused on DOE's progress in implementing GAO's priority recommendations, withhold funds when appropriate, or take other actions to provide incentives for agencies to act. Moreover, Congress could follow up during the appropriations process and request periodic updates. Congress also plays a key role in addressing any underlying issues related to the implementation of these recommendations. For example, Congress could pass legislation providing an agency explicit authority to implement a recommendation or requiring an agency to take certain actions to implement a recommendation.

Copies of this report are being sent to the Director of OMB, the Administrator of NNSA, and the appropriate congressional committees. In addition, the report will be available on the GAO website at <http://www.gao.gov>.

I appreciate DOE's continued commitment to these important issues. If you have any questions or would like to discuss any of the issues outlined in this letter, please do not hesitate to contact me or Mark Gaffigan, Managing Director, Natural Resources and Environment, at 202-512-3841 or gaffiganm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Our teams will continue to coordinate with your staff on all of the 216 open recommendations, as well as those additional recommendations in the high-risk areas for which DOE has a leading role. Thank you for your attention to these matters.

Sincerely yours,

A handwritten signature in black ink, reading "Gene L. Dodaro". The signature is written in a cursive, flowing style with a long horizontal stroke at the end.

Gene L. Dodaro
Comptroller General
Of the United States

Enclosure

cc: The Honorable Jill Hruby, Administrator, National Nuclear Security Administration
The Honorable Shalanda Young, Director, Office of Management and Budget

¹³James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, § 7211(a)(2), 136 Stat. 2395, 3668 (2022); H.R. Rep. No. 117-389 (2022) (accompanying Legislative Branch Appropriations Act, H.R. 8237, 117th Cong. (2022)).

Enclosure

Priority Open Recommendations to the Department of Energy (DOE)

Improving Project, Program, and Portfolio Management

Fusion Energy: Actions Needed to Finalize Cost and Schedule Estimates for U.S. Contributions to an International Experimental Reactor. [GAO-14-499](#). Washington, D.C.: June 5, 2014.

Year Recommendation Made: 2014

Recommendation: To reduce uncertainty about the expected cost and schedule of the International Thermonuclear Experimental Reactor (ITER) Project and its potential impact on the U.S. fusion program, once the ITER organization completes its reassessment of the international project schedule, the Secretary of Energy should direct the Associate Director of the Office of Fusion Energy Sciences to use that schedule, if reliable, to propose a final, stable funding plan for the U.S. ITER Project, approve a performance baseline with finalized cost and schedule estimates, and communicate this information to Congress.

Action Needed: DOE agreed with our recommendation. As of March 2023, DOE officials expected an updated cost and schedule estimate by September 2023. Approving a performance baseline for the entire U.S. ITER Project and communicating this information to Congress will better enable measurement of the project's progress and allow Congress to make informed funding decisions.

Director: Frank Rusco, Natural Resources and Environment

Contact Information: ruscof@gao.gov or (202) 512-3841

Hanford Waste Treatment Plant: DOE Is Pursuing Pretreatment Alternatives, but Its Strategy Is Unclear While Costs Continue to Rise. [GAO-20-363](#). Washington, D.C.: May 12, 2020.

Year Recommendation Made: 2020

Recommendation: The Secretary of Energy should direct the Assistant Secretary of Environmental Management (EM) to ensure that EM's final analysis of alternatives (AOA) for high-level waste pretreatment at the Hanford site includes a definition of mission need and life-cycle cost estimates for the baseline or status quo alternative, as called for in the best practices for an AOA process that we have identified and in DOE guidance.

Action Needed: DOE agreed with our recommendation, in principle. In January 2023, DOE released its Waste Treatment and Immobilization Plant High-Level Waste Treatment AOA. To fully address this recommendation, DOE's AOA should include a definition of mission need and life-cycle cost estimates for the baseline or status quo alternative, consistent with best practices and DOE guidance. Without these key elements of an AOA, EM's waste treatment decisions may not reflect the best options or be credible with stakeholders.

High-Risk Areas: [Acquisition and Program Management for DOE's National Nuclear Security Administration and Office of Environmental Management](#) and the [U.S. Government's Environmental Liability](#)

Director: Nathan J. Anderson, Natural Resources and Environment

Contact Information: andersonn@gao.gov or (202) 512-3841

Nuclear Security Enterprise: NNSA Should Use Portfolio Management Leading Practices to Support Modernization Efforts. [GAO-21-398](#). Washington, D.C.: June 9, 2021.

Year Recommendation Made: 2021

Recommendation: The NNSA Administrator should establish an enterprise-wide portfolio management framework. The framework should define the portfolio of weapons stockpile and infrastructure maintenance and modernization programs and its governance roles, as well as include portfolio-level selection criteria, prioritization criteria, and performance metrics.

Action Needed: NNSA agreed in principle with our recommendation. NNSA defined the Weapons Activities portfolio as including weapons stockpile and infrastructure maintenance and modernization programs in its fiscal year 2022 *Stockpile Stewardship and Management Plan*. Further, it identified a position to serve as the portfolio manager in a June 2021 directive. Additionally, in response to a requirement in the National Defense Authorization Act for Fiscal Year 2022, NNSA provided a November 2022 briefing to Congress on its progress in addressing our recommendation. In the briefing materials, NNSA provided a structure for the Weapons Activities portfolio that generally aligns with the Weapons Activities budget structure and includes scopes of work managed by multiple NNSA offices.

NNSA's next steps include establishing the portfolio management process and formalizing it in updated strategic documents. NNSA said that this would take about 2 years. Completing these steps would satisfy our recommendation and provide NNSA with a more structured and defensible approach to managing the billions of dollars of work that comprise the Weapons Activities portfolio.

High-Risk Area: [Acquisition and Program Management for DOE's National Nuclear Security Administration and Office of Environmental Management](#)

Director: Allison B. Bawden, Natural Resources and Environment

Contact Information: bawdena@gao.gov or (202) 512-3841

Carbon Capture and Storage: Actions Needed to Improve DOE Management of Demonstration Projects. [GAO-22-105111](#). Washington, D.C.: December 20, 2021.

Year Recommendations Made: 2022

Recommendations: The Principal Deputy Assistant Secretary for the Office of Fossil Energy and Carbon Management should

- 1) incorporate into any future carbon capture and storage (CCS) demonstration project selections a down-selection and allow adequate time for negotiations prior to entering cooperative agreements; and

- 2) take actions to more consistently administer future CCS demonstration projects against established scopes, schedules, and budgets.

Actions Needed: DOE neither agreed nor disagreed with our recommendations. In its response to our report, DOE stated that it was establishing a new Office of Clean Energy Demonstrations that would be better positioned to evaluate our recommendations and develop a corrective action plan. As of January 2023, DOE indicated that it was continuing to develop a project management approach and procedures to guide the new office's oversight of demonstration projects against their planned scopes, schedules, and budgets. DOE also needs to amend its selection process to incorporate a down-selection and reserve adequate time for negotiations. By doing so, DOE can better ensure that, in any future CCS demonstration program, it selects and negotiates projects more likely to succeed and mitigates its financial exposure.

Director: Frank Rusco, Natural Resources and Environment

Contact Information: ruscof@gao.gov or (202) 512-3841

Nuclear Energy Projects: DOE Should Institutionalize Oversight Plans for Demonstrations of New Reactor Types. [GAO-22-105394](#). Washington, D.C.: September 8, 2022.

Year Recommendation Made: 2022

Recommendation: The Secretary of Energy should ensure that the Assistant Secretary for Nuclear Energy and the Director of the Office of Clean Energy Demonstrations coordinate and institutionalize via documentation their processes for providing oversight for large nuclear energy demonstration projects, including the use of external independent reviews, steps for addressing any risks identified, and criteria for which projects should use these processes.

Actions Needed: DOE agreed with our recommendation. In its response to our report, DOE's Offices of Nuclear Energy and Clean Energy Demonstrations stated that they are taking steps to document their processes for providing oversight of large nuclear demonstration projects—including the use of external independent peer reviews—and for ensuring close cooperation. Finalizing documentation of these processes will allow DOE to share best practices across offices, which could result in stronger federal oversight of the projects and improved project performance. Further, because the Office of Clean Energy Demonstrations will oversee other large energy demonstration projects going forward, documenting these processes could result in stronger federal oversight, more broadly.

Director: Frank Rusco, Natural Resources and Environment

Contact Information: ruscof@gao.gov or (202) 512-3841

Improving Contract Management

Department of Energy Contracting: Improvements Needed to Ensure DOE Assesses Its Full Range of Contracting Fraud Risks. [GAO-21-44](#). Washington, D.C.: January 13, 2021.

Year Recommendation Made: 2021

Recommendation: The Office of the Chief Financial Officer should expand its methodology for developing its agency-wide fraud risk assessment to ensure that all inherent fraud risks—not limited to top fraud risks—facing DOE programs are fully assessed and documented, in accordance with leading practices.

Action Needed: DOE agreed with our recommendation but stated in its response to our report that it believed it had completed actions to implement our recommendation. However, DOE has since updated its risk profile template so that reporting entities assess the likelihood and impact of every risk identified in their risk profiles and the extent to which controls mitigate those risks, consistent with leading practices. To fully address our recommendation, DOE needs to take actions to document whether the residual risk is within the agency's fraud risk tolerance. By doing so, DOE will better ensure that its fraud risk assessment is complete and fully documented.

High-Risk Area: [Acquisition and Program Management for DOE's National Nuclear Security Administration and Office of Environmental Management](#)

Directors: Rebecca Shea, Forensic Audits and Investigative Services; and Allison B. Bawden, Natural Resources and Environment

Contact Information: shear@gao.gov or (202) 512-6722; bawdena@gao.gov or (202) 512-3841

Department of Energy: Improvements Needed to Strengthen Strategic Planning for the Acquisition Workforce. [GAO-22-103854](#). Washington, D.C.: November 16, 2021.

Year Recommendation Made: 2022

Recommendation: The Chief Acquisition Officer should work with program and other offices, including NNSA, to lead ongoing and thorough analyses to identify gaps in skills and competencies for the agency's acquisition workforce and develop strategies to address identified gaps. This should include an analysis of the appropriate size of the acquisition workforce.

Action Needed: DOE concurred with the recommendation. In a March 2022 letter describing actions that DOE planned to take to address the recommendations, DOE officials said that they planned to survey DOE's acquisition workforce every 2 years and use survey findings to address identified gaps in skills and competencies. DOE officials also said that they planned to evaluate DOE's existing Procurement Management and Review program to determine ways to better identify gaps in skills and competencies within its acquisition workforce. To fully implement our recommendation, DOE should also completely and thoroughly identify any skill and competency gaps for its acquisition workforce. By better understanding these gaps, DOE can improve the information it has to develop its budget and strategies to build a workforce with the right skills and of the right size to address the agency's long-standing contract management issues.

High-Risk Area: [Acquisition and Program Management for DOE's National Nuclear Security Administration and Office of Environmental Management](#)

Director: Allison B. Bawden, Natural Resources and Environment

Contact Information: bawdena@gao.gov or (202) 512-3841

Hanford Cleanup: DOE Has Opportunities to Better Ensure Effective Startup and Sustained Low-Activity Waste Operations. [GAO-22-104772](#). Washington, D.C.: June 14, 2022.

Year Recommendation Made: 2022

Recommendation: The Assistant Secretary of EM should ensure that existing challenges and problems identified in its review of facilities, systems, and components related to Direct-Feed Low-Activity Waste (DFLAW) are resolved by the end of hot commissioning.

Actions Needed: DOE agreed with our recommendation. Resolving all design and construction challenges and problems with the facilities, systems, and components needed to start and sustain DFLAW operations by the end of hot commissioning—the point at which the facility has demonstrated its ability to produce immobilized low-activity waste at an acceptable quality—will help DOE ensure that the costs to resolve challenges and problems do not fall on DOE.

High-Risk Area: [Acquisition and Program Management for DOE's National Nuclear Security Administration](#)

Director: Nathan J. Anderson, Natural Resources and Environment

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Enhancing Energy Reliability, Security, and Resilience

Strategic Petroleum Reserve: DOE Needs to Strengthen Its Approach to Planning the Future of the Emergency Stockpile. [GAO-18-477](#). Washington, D.C.: May 30, 2018.

Year Recommendations Made: 2018

Recommendations: The Secretary of Energy should

- 1) take actions to ensure that the agency periodically conducts and provides to Congress a strategic review of the Strategic Petroleum Reserve (SPR) that, among other things, takes into account changes in crude oil and petroleum product market conditions and contains additional analysis, such as the costs and benefits of a wide range of different SPR sizes; and
- 2) conduct or complete studies on the costs and benefits of regional petroleum product reserves for all U.S. regions that have been identified as vulnerable to fuel supply disruptions, and the Secretary should report the results to Congress.

Actions Needed: DOE agreed with our first recommendation and said that a 5-year time interval between reviews was appropriate and would allow current strategic plans to be implemented and assessed. Although DOE officials said that DOE would complete a long-term strategic review by the end of fiscal year 2021, as of January 2023, DOE had not finalized its review. DOE needs to ensure that it undertakes a strategic review on a periodic basis going forward. Without addressing the limitations of its last review and periodically performing reexaminations, DOE cannot be assured that the SPR will be sized appropriately into the future.

DOE disagreed with our second recommendation and stated that it believes that government-owned and -operated regional petroleum product reserves are an inefficient and expensive solution to regional fuel supply disruptions and that it would be an inappropriate use of taxpayer funds to conduct additional studies. However, the Quadrennial Energy Review of 2015 recommended that DOE complete similar analyses for other areas that DOE deemed vulnerable to fuel supply disruptions. Therefore, we continue to believe that conducting these analyses will provide Congress with information that it needs to make decisions about regional product reserves.

Director: Frank Rusco, Natural Resources and Environment

Contact Information: ruscof@gao.gov or (202) 512-3841

Electricity Grid: Opportunities Exist for DOE to Better Support Utilities in Improving Resilience to Hurricanes. [GAO-21-274](#). Washington, D.C.: March 5, 2021.

Year Recommendation Made: 2021

Recommendation: The Secretary of Energy should establish a plan, including time frames, as appropriate, to guide the agency's efforts to develop tools for resilience planning, such as performance measures for resilience, a framework for resilience planning, and additional information on the cost of long-term power outages.

Actions Needed: DOE agreed with our recommendation, in principle. Officials told us that a Community of Practice, within DOE's Office of Electricity, meets monthly to discuss DOE's ongoing energy resilience projects and other resilience-related efforts. The division is also compiling a catalogue of existing resilience tools and models to better understand existing energy resilience planning capabilities and to identify gaps. Additionally, in May 2022, DOE officials told us that they aimed to complete a plan of action for energy sector risk management by September 30, 2022. However, as of March 2023, DOE had not published this plan.

While DOE's efforts to identify existing resilience planning tools and potential gaps are steps in the right direction, DOE needs to establish a plan that includes time frames, as appropriate, to guide the agency's effort to develop tools for resilience planning. Without a plan to guide DOE's efforts to further develop tools that could support grid resilience planning and investments, these efforts could stall or remain incomplete, further delaying the development of tools needed by utilities and other stakeholders that face challenges in evaluating and justifying investments in resilience measures.

High-Risk Area: [Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks](#)

Director: Frank Rusco, Natural Resources and Environment

Contact Information: ruscof@gao.gov or (202) 512-3841

Electricity Grid Resilience: Climate Change Is Expected to Have Far-reaching Effects and DOE and FERC Should Take Actions. [GAO-21-346](#). Washington, D.C.: March 5, 2021.

Year Recommendation Made: 2021

Recommendation: The Secretary of Energy should develop and implement a department-wide strategy to coordinate its efforts that defines goals and measures progress to enhance the resilience of the electricity grid to the risks of climate change.

Actions Needed: DOE agreed with our recommendation. In August 2022, DOE officials briefed Congress on recent updates to the Grid Modernization Initiative strategy that it updated in December 2020. DOE officials said that DOE plans to issue the updated strategy in September 2023, which will include goals and measures to enhance grid resilience against climate change risks. Developing and implementing such a strategy could improve DOE's ability to address risks and help guide and prioritize DOE's efforts and ensure that resources are targeted effectively.

High-Risk Area: [Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks](#)

Director: Frank Rusco, Natural Resources and Environment

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Addressing Nuclear Modernization Challenges

National Nuclear Security Administration: Action Needed to Address Affordability of Nuclear Modernization Programs. [GAO-17-341](#). Washington, D.C.: April 26, 2017.

Year Recommendation Made: 2017

Recommendation: To help NNSA put forth more credible modernization plans, the NNSA Administrator should include an assessment of the affordability of NNSA's portfolio of modernization programs in future versions of the *Stockpile Stewardship and Management Plan*—for example, by presenting options that NNSA could consider to bring its estimates of modernization funding needs into alignment with potential future budgets, such as potentially deferring the start of, or canceling, specific modernization programs.

Actions Needed: NNSA did not explicitly agree or disagree with our recommendation. While NNSA included information about its analysis of the affordability of its weapons modernization plans in its fiscal years 2020 and 2021 *Stockpile Stewardship and Management Plan*, the fiscal year 2022 plan did not include such analysis. According to that plan, this was because no out-year budget projections were available because of the administration's then ongoing Nuclear Posture Review and development of a National Defense Strategy. In March 2023, NNSA said that it planned to publish the fiscal year 2023 plan in the coming weeks.

To fully address this recommendation, NNSA should include assessments of the affordability of its modernization programs in future versions of its *Stockpile Stewardship and Management Plan*. For instance, when the estimated cost range for the planned modernization portfolio appears to exceed future available budget estimates, NNSA should identify potential options for bringing its plans and estimated funding needs for the portfolio into alignment with projections for future budgets. At a minimum, this could include identifying the highest-priority elements of

the modernization portfolio where NNSA—after consultation with the Department of Defense—believes it cannot defer, cancel, or adjust the scope or schedule of planned programs or projects. Doing so would help congressional and NNSA decision makers better understand the potential rebalancing of priorities and trade-offs that may need to be undertaken to address affordability concerns.

Director: Allison B. Bawden, Natural Resources and Environment

Contact Information: bawdena@gao.gov or (202) 512-3841

Nuclear Weapons: NNSA Should Further Develop Cost, Schedule, and Risk Information for the W87-1 Warhead Program. [GAO-20-703](#). Washington, D.C.: September 9, 2020.

Year Recommendation Made: 2020

Recommendation: The NNSA Administrator should direct the Office of Defense Programs' plutonium program office to ensure that the integrated master schedule in development for pit production meets NNSA integrated master schedule standards, consistent with best practices for schedule development.

Action Needed: NNSA agreed with our recommendation. However, in January 2023, we found that the pit production integrated master schedule that NNSA implemented on October 1, 2021, did not meet minimum qualifications to be considered an integrated master schedule, according to published best practices in GAO's Schedule Guide.¹⁴ In response, NNSA stated that it would continue to refine its integrated master schedule for plutonium pit production to align it with GAO best practices. By doing so, NNSA would better ensure that it has adequate pits to meet planned W87-1 production.

High-Risk Area: [Acquisition and Program Management for DOE's National Nuclear Security Administration and Office of Environmental Management](#)

Director: Allison B. Bawden, Natural Resources and Environment

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Nuclear Weapons: NNSA Does Not Have a Comprehensive Schedule or Cost Estimate for Pit Production Capability. [GAO-23-104661](#). Washington, D.C.: January 12, 2023.

Year Recommendation Made: 2023

Recommendation: The NNSA Administrator should ensure that the head of the Plutonium Modernization program develops a life-cycle cost estimate for establishing NNSA's pit production capability that aligns with GAO cost estimating best practices.

¹⁴GAO, *Nuclear Weapons: NNSA Does Not Have a Comprehensive Schedule or Cost Estimate for Pit Production Capability*, [GAO-23-104661](#) (Washington, D.C.: Jan. 12, 2023).

Actions Needed: NNSA concurred with our recommendation. NNSA officials said that they plan to develop a life-cycle cost estimate by September 30, 2025, after establishing baseline cost and schedule estimates for the Savannah River Plutonium Processing Facility and the Los Alamos Plutonium Pit Production Project. We noted in our response to agency comments that this time frame means the program will have reached major milestones in fiscal years 2024 and 2025 without a life-cycle cost estimate, according to NNSA's plans. During this time, NNSA will have spent billions of dollars without having an overall estimate of total program costs. We encourage NNSA to develop both its programmatic life-cycle cost estimate and integrated master schedule and to view both as tools for managing a complex and expensive program. Developing this estimate could improve NNSA's decision-making, the efficiency and effectiveness of its efforts, and the quality of information that it provides to Congress.

Director: Allison B. Bawden, Natural Resources and Environment

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Addressing DOE's Environmental and Disposal Liability

Hanford Cleanup: DOE's Efforts to Close Tank Farms Would Benefit from Clearer Legal Authorities and Communication. [GAO-21-73](#). Washington, D.C.: January 7, 2021.

Year Recommendation Made: 2021

Recommendation: The Secretary of Energy should direct the Assistant Secretary of EM to obtain the assistance of an independent, third-party mediator to help reach agreement with the state of Washington's Department of Ecology on a process for assessing the contaminated soil and what role the Nuclear Regulatory Commission (NRC) should play in this process.

Actions Needed: DOE agreed with our recommendation. However, in January 2023, DOE told us that it was still engaged in mediated negotiations with the U.S. Environmental Protection Agency and Washington's Department of Ecology that started in June 2020. While DOE officials previously told us that these actions addressed our recommendation, DOE still needs to resolve the significant disagreement with the state of Washington on how to address soil contamination under the applicable legal agreements, including what role NRC should play. By using an independent mediator to help reach agreement on these issues, DOE would be better positioned to avoid future cleanup delays.

High-risk Area: [U.S. Government's Environmental Liability](#)

Director: Nathan J. Anderson, Natural Resources and Environment

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Commercial Spent Nuclear Fuel: Congressional Action Needed to Break Impasse and Develop a Permanent Disposal Solution. [GAO-21-603](#). Washington, D.C.: September 23, 2021.

Year Recommendation Made: 2021

Recommendation: The Secretary of Energy should direct the Office of Nuclear Energy to continue its efforts to engage the public and finalize its draft consent-based siting process.

Action Needed: DOE agreed with our recommendation and stated that it was resuming consent-based siting activities. DOE analyzed and summarized the comments it received in response to its December 2021 request for information on a consent-based siting process that it would use to identify sites to store the nation's spent nuclear fuel. In September 2022, DOE published the results on its website and issued a funding opportunity announcement for interested stakeholders and communities to learn more about spent nuclear fuel management, consent-based siting, and consolidated interim storage. DOE still needs to update its draft consent-based siting process based on the comments it received and any information gathered from its efforts to engage communities. Finalizing the draft could help position DOE to implement a consent-based process for selecting locations of consolidated interim storage facilities and/or permanent geologic repositories, and constructing these facilities if Congress amends the Nuclear Waste Policy Act of 1982 to allow for storage and disposal options.¹⁵

High-Risk Area: [U.S. Government's Environmental Liability](#)

Director: Frank Rusco, Natural Resources and Environment

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Nuclear Waste Cleanup: Actions Needed to Determine Whether DOE's New Contracting Approach is Achieving Desired Results. [GAO-22-105417](#). Washington, D.C., September 28, 2022.

Year Recommendation Made: 2022

Recommendation: The Assistant Secretary of EM should develop and document specific performance goals for the End State Contracting Model (ESCM) and measures to track progress toward achieving them. EM should use this performance information to improve the ESCM and to better ensure that it is achieving desired results.

Actions Needed: DOE agreed with our recommendation, and EM recently modified its guidance to require each field site to identify metrics for evaluating contract performance. EM is also formalizing an ESCM oversight model that includes performance measures. Implementing a formal, structured process to assess the ESCM's rollout and developing performance measures would help EM better identify and address weaknesses and ensure that the model is achieving desired results before it awards billions more through the ESCM.

Director: Nathan J. Anderson, Natural Resources and Environment

¹⁵Pub. L. No. 97-425, §§ 111-113, 96 Stat. 2201, 2207-12 (1983) (codified as amended at 42 U.S.C. §§ 10131-33). DOE is limited on beginning construction on any interim storage facilities without action by Congress. We made four Matters for Congressional Consideration in this report, including that Congress should consider amending the Nuclear Waste Policy Act to authorize a new consent-based process for siting, developing, and constructing consolidated interim storage and permanent repository facilities for commercial spent nuclear fuel. See GAO, *Commercial Spent Nuclear Fuel: Congressional Action Needed to Break Impasse and Develop a Permanent Disposal Solution*, [GAO-21-603](#) (Washington, D.C.: Sept. 23, 2021).

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Addressing Insider Threat and Cybersecurity

Critical Infrastructure Protection: Additional Actions Are Essential for Assessing Cybersecurity Framework Adoption. [GAO-18-211](#). Washington, D.C.: February 15, 2018.

Year Recommendation Made: 2018

Recommendation: The Secretary of Energy should take steps to consult with respective sector partners, such as the sector coordinating council; Department of Homeland Security; and National Institute of Standards and Technology, as appropriate, to develop methods for determining the level and type of framework adoption by entities across their respective sector.

Action Needed: DOE did not explicitly agree or disagree with our recommendation. As of January 2023, DOE had not completed its planned efforts to collect more information on the level and type of framework adoption throughout the energy sector. DOE needs to effectively implement these steps to determine framework adoption among entities within its sector. Until sector risk management agencies have a more comprehensive understanding of the use of the cyber framework by the critical infrastructure sectors, they will be limited in their ability to understand the success of protection efforts or to determine where to focus limited resources for cyber risk mitigation.

High-Risk Area: [Ensuring the Cybersecurity of the Nation](#)

Director: David B. Hinchman, Information Technology and Cybersecurity

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Cybersecurity: Agencies Need to Fully Establish Risk Management Programs and Address Challenges. [GAO-19-384](#). Washington, D.C.: July 25, 2019.

Year Recommendation Made: 2019

Recommendation: The Secretary of Energy should develop a cybersecurity risk management strategy that includes the key elements identified in this report.

Action Needed: DOE agreed with our recommendation. DOE's Enterprise Cybersecurity Program Plan (E-CSPP), issued in January 2022, and its risk management amplification guidance address most elements of a risk management strategy that we identified in our report. However, as of March 2023, neither the E-CSPP nor most of the departmental element plans we reviewed included a detailed discussion of organizational risk tolerance. Without ensuring that its plans provide such a discussion, DOE may lack a clear organization-wide understanding of acceptable risk levels and appropriate risk response strategies to protect its systems and data.

High-Risk Area: [Ensuring the Cybersecurity of the Nation](#)

Director: Marisol Cruz Cain, Information Technology and Cybersecurity

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Critical Infrastructure Protection: Actions Needed to Address Significant Cybersecurity Risks Facing the Electric Grid. [GAO-19-332](#). Washington, D.C.: August 26, 2019.

Year Recommendation Made: 2019

Recommendation: The Secretary of Energy, in coordination with the Department of Homeland Security and other relevant stakeholders, should develop a plan aimed at implementing the federal cybersecurity strategy for the electric grid and ensure that the plan addresses the key characteristics of a national strategy, including a full assessment of cybersecurity risks to the grid.

Actions Needed: DOE agreed with our recommendation. As of February 2023, DOE did not have an estimated date for issuing a plan related to addressing all of the key characteristics needed to implement a national strategy, such as fully assessing cybersecurity risks to the electricity grid. DOE needs to develop a plan for implementing the federal cybersecurity strategy for the electric grid, ensure that the plan addresses the key characteristics of a national strategy, and coordinate that plan with the Department of Homeland Security and other relevant stakeholders. Until DOE develops a plan and ensures it addresses all of the key characteristics of a national strategy—including a full assessment of cybersecurity risks—decision makers responsible for allocating resources to address risks and challenges will have limited guidance.

High-Risk Area: [Ensuring the Cybersecurity of the Nation](#)

Directors: Frank Rusco, Natural Resources and Environment; and Marisol Cruz Cain, Information Technology and Cybersecurity

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Nuclear Weapons Cybersecurity: NNSA Should Fully Implement Foundational Cybersecurity Risk Management Practices. [GAO-22-104195](#). Washington, D.C.: September 22, 2022.

Year Recommendations Made: 2022

Recommendations:

The NNSA Administrator should

- 1) direct the Office of Information Management to identify the needed resources to implement foundational practices for the operational technology environment, such as by developing an operational technology activity business case for consideration in NNSA's planning, programming, budgeting, and evaluation process.

The Director of NNSA's Office of Acquisition and Project Management should

- 2) clarify and reinforce to management and operating (M&O) contractors, such as by a policy flash or other communication, that they are required to monitor subcontractor's cybersecurity measures; and

- 3) include performance criteria evaluating contractor oversight of subcontractor cybersecurity measures in the annual M&O contractor performance evaluation process.¹⁶

Actions Needed: NNSA agreed with the recommendations. In response to our report, NNSA stated the following:

- 1) NNSA plans to identify the needed resources for developing an operational technology business case within Cybersecurity Improvement Plans and cyber program budgets through the Planning, Programming, Budgeting and Evaluation process.
- 2) NNSA updated a revised Cybersecurity Program Execution Guidance in December 2022, and intends to add further clarifying guidance in its planned May 2023 revision of Supplemental Directive 205.1, Baseline Cybersecurity Program, according to an NNSA document. NNSA stated that it might also issue a policy flash, if necessary, after it releases its revised supplemental directive.
- 3) The December 2022 Cybersecurity Program Execution Guidance will provide performance details that can be used as part of the contractor performance evaluation process.

However, NNSA has not provided the revised guidance document, and it is unclear how this document will be incorporated into the performance evaluation process.

Implementing our recommendations will better position NNSA to marshal the resources necessary to develop an operational technology cybersecurity management framework that aligns with foundational risk management practices. NNSA would also close gaps in M&O contractor oversight of subcontractors and ensure more consistent protection of information and systems. In addition, NNSA would close gaps in its own limited information about contractor monitoring of subcontractors and have greater assurance that information is being protected, as required.

Director: David B. Hinchman, Information Technology and Cybersecurity; and Allison B. Bawden, Natural Resources and Environment

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Privacy: Dedicated Leadership Can Improve Programs and Address Challenges, GAO-22-105065. Washington, D.C.: September 22, 2022.

Year Recommendation Made: 2022

Recommendation: The Secretary of Energy should establish a time frame for fully defining the role of the senior agency official for privacy or other designated privacy official in reviewing and approving system categorizations, overseeing privacy control assessments, and reviewing authorization packages, and document these roles.

¹⁶In July 2022, NNSA dissolved the Office of Acquisition and Project Management, and the acquisition management function was moved into a newly formed Office of Partnership and Acquisition Services. We are working with this new office on the status of the recommendation.

Actions Needed: DOE agreed with our recommendation. In response to our report, DOE stated that its Office of the Chief Information Officer is in the process of updating DOE Order 206.1, DOE Privacy Program. According to DOE officials, the updated order will document and define the role of the senior agency official for privacy (SAOP) in reviewing and approving system categorizations, overseeing privacy control assessments, and reviewing authorization packages. DOE also intends to whether additional delegations are needed to empower the SAOP to perform the relevant functions. Completing this update and review will help DOE ensure that privacy protections are adequately incorporated in systems with personally identifiable information.

Director: Jennifer R. Franks, Information Technology and Cybersecurity

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Nuclear Security: DOE Should Take Actions to Fully Implement Insider Threat Program. GAO-23-105576. Washington, D.C.: May 24, 2023.

Year Recommendation Made: 2023

Recommendations:

- 1) The Insider Threat Program senior official should establish a process to better integrate insider threat responsibilities, ensuring that the senior official can centrally manage all aspects of the Insider Threat Program.
- 2) The Secretary of Energy should ensure that the Insider Threat Program achieves a single, department-wide approach to managing insider risk.

Actions Needed: DOE agreed with our recommendations. In February 2023, DOE issued a memo designating the Director of the Office of Environment, Health, Safety, and Security as the designated senior official for agency's Insider Threat Program. The Secretary directed the designated senior official to integrate DOE's many physical and information security capabilities into a single, comprehensive risk management framework. The designated senior official said that a strategic review was underway to identify needed process changes by June 30, 2023. We will review the results of DOE's strategic review and the implementation of those changes to determine DOE's progress in implementing our recommendations. Without better integrating insider threat responsibilities, DOE's program will continue to face significant challenges that preclude it from having an effective or fully operational program.

High-Risk Area: [Acquisition and Program Management for DOE's National Nuclear Security Administration and Office of Environmental Management](#)

Director: Allison Bawden, Natural Resources and Environment

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Addressing Worker Protections

Department of Energy: Whistleblower Protections Need Strengthening. GAO-16-618. Washington, D.C.: July 11, 2016.

Year Recommendation Made: 2016

Recommendation: To help improve DOE's ability to take enforcement actions against unlawful retaliation, when appropriate, and take action against contractors that create a chilled work environment, the Secretary of Energy should revise DOE's Integrated Safety Management policy and guidance to clarify what constitutes evidence of a chilled work environment and define the appropriate steps that DOE should take to hold contractors accountable for creating a chilled work environment.

Actions Needed: DOE agreed with our recommendation. However, DOE's revised Integrated Safety Management Policy 450.4A still does not define the appropriate steps that DOE should take to hold contractors accountable for creating a chilled work environment. As of February 2023, officials said they were reviewing several policies and orders that will help address the issues related to our recommendation. DOE needs to revise its safety management guidance to include the elements that we recommended. By doing so, DOE will be better able to hold contractors accountable for addressing chilled work environments and increase contractor employee confidence in the mechanisms for raising safety concerns.

Director: Allison B. Bawden, Natural Resources and Environment

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Sexual Harassment: NNSA Could Improve Prevention and Response Efforts in Its Nuclear Security Forces. GAO-21-307. Washington, D.C.: April 19, 2021.

Year Recommendation Made: 2021

Recommendation: The Secretary of Energy should fully implement plans to address the department's Equal Employment Opportunity (EEO) program deficiencies relevant to sexual harassment and work with NNSA to fully implement plans to address the agency's EEO program deficiencies relevant to sexual harassment.

Actions Needed: DOE agreed with our recommendation. As of January 2023, DOE reported that it had implemented plans to address nine of its 10 EEO program deficiencies relevant to sexual harassment. In September 2021 and January 2022, the Equal Employment Opportunity Commission verified that NNSA had addressed two of its three EEO program deficiencies relevant to sexual harassment. DOE should fully implement its plans to address its EEO program deficiencies relevant to sexual harassment and work with NNSA to address its remaining deficiency. Without fully implementing plans to address the identified deficiencies, both agencies may be missing opportunities to establish and maintain effective EEO programs relevant to preventing and responding to sexual harassment in NNSA's federal nuclear security force.

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