



441 G St. N.W.
Washington, DC 20548

June 27, 2022

The Honorable Jennifer M. Granholm
Secretary
U.S. Department of Energy
1000 Independence Ave., SW
Washington, D.C. 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 personal attention to areas where open recommendations should be given high priority.¹ In November 2021, we reported that on a government-wide basis, 76 percent of our recommendations made 4 years ago were implemented.² DOE's recommendation implementation rate was 68 percent. As of June 2022, DOE had 196 open recommendations. Fully implementing these open recommendations could significantly improve agency operations.

Since our June 2021 letter, DOE implemented six of our 25 open priority recommendations by taking the following actions:

- The Savannah River National Laboratory and the National Academies of Science, Engineering, and Medicine issued reports with information that DOE could use in making a decision about treating supplemental low-activity waste. Subsequently DOE officials announced plans to conduct the second phase of a project to demonstrate the feasibility of grouting, transporting, and disposing of low-activity waste.³
- DOE issued a program management policy that included guiding principles and established expectations for program management and assigned responsibilities and competencies for program managers.⁴

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 2021*, [GAO-22-4SP](#) (Washington, D.C.: Nov. 15, 2021).

³GAO, *Nuclear Waste: Opportunities Exist to Reduce Risks and Costs by Evaluating Different Waste Treatment Approaches at Hanford*, [GAO-17-306](#) (Washington, D.C.: May 3, 2017).

⁴GAO, *Program Management: DOE Needs to Develop a Comprehensive Policy and Training Program*, [GAO-17-51](#) (Washington, D.C.: Nov. 21, 2016).

- In January 2022, DOE issued a Policy Flash for contracting officers that summarizes how contracting officers are to perform independent analyses when reviewing conflicts of interest among other things.⁵
- The Office of Environmental Management (EM) issued a Program Management Protocol that replaced EM's 2017 cleanup policy and includes key elements of project and program management leading practices.⁶ As of June 2022, implementation of the new protocol is ongoing.
- DOE assessed its improper payments and determined that its improper payment rate did not exceed \$100 million in any given year from fiscal years 2006 to 2019. DOE also started tracking the year in which improper payments occurred and the year in which DOE identified them.⁷

Additionally, we determined that one open recommendation that related to National Nuclear Security Administration (NNSA) contractor governance no longer warranted priority attention because of other actions taken to strengthen governance processes.⁸

We ask your attention to the remaining 18 priority recommendations. We are also adding eight new recommendations related to project, program, and portfolio management; contract management; and DOE's environmental and disposal liability. These recommendations bring the total number of priority recommendations to 26 (See enclosure for the list of recommendations and the actions needed to implement them.)

The 26 priority recommendations fall into the following eight major areas.

1. **Improve Project, Program, and Portfolio Management.** DOE historically has struggled with managing programs and projects, including mitigating the risks of uncontrolled changes to scope, cost and schedule overruns, failure to meet goals, and increasing environmental liabilities. Implementing our eight priority recommendations in this area, such as including best practices 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.
2. **Improve Contract Management.** Contract management is one of the highest risks facing the government, and aspects of DOE's contract management and administration have been on GAO's [High-Risk List](#) since its inception in 1990. By implementing our two priority recommendations, including assessing and documenting inherent fraud risks and identifying

⁵GAO, *Department of Energy Contracting: Actions Needed to Strengthen Subcontract Oversight*, [GAO-19-107](#) (Washington, D.C.: Mar. 12, 2019).

⁶GAO, *Nuclear Waste Cleanup: DOE Could Improve Program and Project Management by Better Classifying Work and Following Leading Practices*, [GAO-19-223](#) (Washington, D.C.: Feb. 19, 2019).

⁷GAO, *Improper Payments: Improvements Needed to Ensure Reliability and Accuracy in DOE's Risk Assessments and Reporting*, [GAO-20-442](#) (Washington, D.C.: Jun. 17, 2020).

⁸This recommendation will remain open until NNSA issues more specific policies and guidance for using information from contractor assurance systems to conduct oversight of Management and Operating contractors. See GAO, *National Nuclear Security Administration: Actions Needed to Clarify Use of Contractor Assurance Systems for Oversight and Performance Evaluation*, [GAO-15-216](#) (Washington, D.C.: May 22, 2015).

gaps and strategies related to the acquisition workforce, DOE will improve its oversight and management of contractors.

3. **Planning for the Future of the Strategic Petroleum Reserve (SPR).** As of March 2022, the SPR had 566 million barrels of crude oil and was valued at about \$61 billion. Since the SPR was created 4 decades ago, its structure generally has not changed, even as markets for crude oil and petroleum products have changed significantly. Implementing our three priority recommendations, such as conducting a strategic review of the SPR, would enable DOE to better plan for the SPR's future.
4. **Nuclear Modernization Challenges.** NNSA is in the midst of an ambitious, decades-long, and costly effort to modernize the nation's nuclear security enterprise. Implementing our priority recommendation to include an assessment of affordability in an existing plan would help NNSA address challenges to this effort.
5. **Address DOE's Environmental and Disposal Liability.** The federal government's environmental liability has been growing for the past 20 years and is likely to continue to increase. Therefore, we added the federal government's environmental liability to our [High-Risk List](#) in February 2017. DOE is responsible for the largest share of this liability—\$516 billion of the \$613 billion reported in fiscal year 2021. By implementing our five priority recommendations, such as developing a plan for mitigating risks to DOE's transuranic waste cleanup and expanding future analyses of potential disposal options from the Hanford site, DOE could reduce the cleanup costs that contribute to its environmental liability.
6. **Improving Cybersecurity.** The energy sector is part of the nation's critical infrastructure that provides essential services that underpin American society. Recent high-profile cyberattacks targeting the public and private sectors highlight the urgent need to address cybersecurity weaknesses. Implementing three priority recommendations, such as developing a cybersecurity risk management strategy, would improve DOE's efforts to manage cybersecurity risks and to protect the nation's electric grid.
7. **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. Contractor employees carry out the bulk of DOE's mission-related work, and the department has repeatedly recognized that contractor employees 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, would improve DOE's ability to protect DOE and contract workers from unlawful retaliation and sexual harassment.
8. **Electricity Grid Resilience.** Climate change poses risks to the electricity grid that can affect the nation's economic and national security. Furthermore, the federal government's management of climate change risks has been on our [High-Risk List](#) since 2013 because of the fiscal exposure it represents. Implementing our two priority recommendations, including establishing a plan for resilience planning, would enable DOE to enhance electricity grid resilience to severe weather events and climate change.

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In March 2021 we issued our biennial update to our [High-Risk List](#), which identifies government

operations with greater vulnerabilities to fraud, waste, abuse, and mismanagement or the need for transformation to address economy, efficiency, or effectiveness challenges.⁹ One of our high-risk areas—[DOE’s contract and project management for NNSA and the Office of Environmental Management](#)—centers directly on DOE. One additional high-risk area—[addressing the U.S. government’s environmental liability](#)—is shared among multiple agencies, including 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) [improving strategic human capital management](#), (3) [managing federal real property](#), (4) [ensuring the cybersecurity of the nation](#),¹⁰ and (5) [government-wide personnel security clearance process](#). We urge your attention to the DOE, shared, and 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; OMB; and the leadership and staff in agencies, including within 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.¹¹

Copies of this report are being sent to the Director of the Office of Management and Budget and appropriate congressional committees, including the Committees on Appropriations, Budget, Homeland Security and Governmental Affairs, and Energy and Natural Resources, United States Senate, and the Committees on Appropriations, Budget, Oversight and Reform, and Energy and Commerce, House of Representatives. In addition, the report will be available on the GAO website at <http://www.gao.gov>.

⁹GAO, *High-Risk Series: Dedicated Leadership Needed to Address Limited Progress in Most High-Risk Areas*, [GAO-21-119SP](#) (Washington, D.C.: Mar. 2, 2021).

¹⁰With 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).

¹¹GAO, *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).

I appreciate DOE's 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 196 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 that reads "Gene L. Dodaro". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

Gene L. Dodaro
Comptroller General
of the United States

Enclosure – 1

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

Enclosure

Priority Open Recommendations to the Department of Energy

1. Improve 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.

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: The Department of Energy (DOE) agreed with our recommendation. Although DOE has made progress in implementing the recommendation, DOE officials told us in April 2022 that continued COVID-19 impacts and an ongoing effort by the international ITER Organization to update the international project schedule would delay DOE's ability to set a performance baseline for the U.S. project. A schedule is expected by September 2023. To fully address our recommendation, DOE should approve a performance baseline for the entire U.S. ITER Project and communicate information on that baseline to Congress. Doing so would better enable measurement of the project's progress and allow Congress to make informed funding decisions about the project.

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.

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 April 2021, EM officials told us that EM's final AOA would include life-cycle cost estimates consistent with GAO's best practices and DOE guidance. However, as of March 2022, officials had not provided an expected date for completing the AOA. We will continue to monitor the AOA process and evaluate the extent to which EM follows through with its commitment. To fully address this recommendation, DOE should finalize its AOA for high-level waste pretreatment at the Hanford site and ensure that it includes 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 decision on how to pretreat Hanford's high-level waste may not be the best option or be credible with stakeholders.

High-Risk Areas: [DOE's Contract and Project Management for NNSA and Office of Environmental Management](#) and [U.S. Government's Environmental Liability](#)

Director: Nathan J. Anderson, Natural Resources and Environment

Contact information: andersonn@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.

Recommendation: The National Nuclear Security Administration (NNSA) Administrator should direct the Office of Defense Programs to revise its program execution instruction to require that design studies for warhead life extension and replacement programs follow AOA best practices, such as by having a study plan, or to justify and document deviations from best practices.

Action Needed: NNSA generally agreed with our recommendation. In September 2021, NNSA issued a revised version of the program execution instruction that partially addressed our recommendation. In April 2022, NNSA officials agreed to further revise the program execution instruction to fully address our recommendation, but they could not estimate when the next revision of the program execution instruction would be published. To fully address our recommendation, NNSA should revise its program execution instruction to require that design studies for warhead life extension and replacement programs, like the W87-1, follow AOA best practices or to justify and document deviations from those best practices. Such revisions would provide NNSA with better assurance that such programs apply consistent, reliable, and objective approaches to assessing the best options to meet mission needs.

High-Risk Area: [DOE's Contract and Project Management for NNSA and Office of Environmental Management](#)

Director: Allison B. Bawden, Natural Resources and Environment

Contact information: bawdena@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.

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 to establish an enterprise-wide portfolio management framework but stated that it considers the recommendation closed based on existing documents and processes. However, we had examined these documents and processes as part of our review and disagree that they fully address our recommendation. In its comments on our recommendation, NNSA recognized that it was in the early stages of

implementing portfolio management processes for its Weapons Activities portfolio and that the leading practices we identified could be useful in developing a portfolio management approach. NNSA took some actions by defining the portfolio in its fiscal year 2022 *Stockpile Stewardship and Management Plan* and determining a position to serve as the portfolio manager in a June 2021 directive. To fully implement our recommendation, NNSA should develop a cohesive, strategic document that clearly defines the portfolio and how to manage it and prioritize its components. Doing so would provide NNSA with a more structured and defensible approach to managing the billions of dollars of work that comprise the Weapons Activities portfolio.

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.

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

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

Actions Needed: DOE neither agreed nor disagreed with the recommendations. In its response to our report, DOE indicated it was working to establish a new Office of Clean Energy Demonstrations that would be best positioned to evaluate our recommendations and to develop a corrective action plan. As of May 2022, DOE had not provided additional information regarding any actions taken to address our recommendations. To fully implement our recommendation, DOE should amend its selection process to incorporate a down-selection as well as reserving adequate time for negotiations, DOE could better ensure that, in any future CCS demonstration program, it selects and negotiates projects more likely to succeed. Further, by taking actions to more consistently adhere to the principles in DOE's *Guide to Financial Assistance* in any future CCS demonstration projects, DOE would be better positioned to mitigate its financial exposure.

Director: Frank Rusco, Natural Resources and Environment

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

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

Recommendations: The Secretary of Energy should ensure that the Director of the Office of Project Management update

- Order 413.3B to require that program offices develop corrective action plans that will address root causes; and
- Order 413.3B to require that the Office of Project Management assess and validate the extent to which the program office has taken corrective actions to address root causes identified during the baseline change process.

Actions Needed: DOE agreed with these recommendations. To address them, DOE must develop corrective action plans and have an independent office assess and validate that the root causes are addressed. By including these requirements in its project management order, DOE will have greater assurance that the root causes it identifies will not persist or recur on future capital asset projects. In addition, DOE could ensure that projects do not incur additional cost increases and schedule delays.

Director: Nathan J. Anderson, Natural Resources and Environment

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2. Improve 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.

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 considered its actions to implement our recommendation completed. However, since then, DOE has 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 additional actions to document whether the residual risk is within the agency's fraud risk tolerance. By addressing our recommendation, DOE will better ensure that its fraud risk assessment is complete and fully documented.

High-Risk Area: [DOE's Contract and Project Management for NNSA 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.

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. DOE officials stated that they planned to implement this recommendation by surveying its acquisition workforce every 2 years and by using findings from the survey to address identified gaps in skills and competencies. DOE officials also stated 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. In addition to completing these actions, to fully implement our recommendation, DOE should also completely and thoroughly identify any skill and competency gaps for its acquisition workforce. With a better understanding of skill and competency gaps for its acquisition workforce, 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 Areas: [DOE's Contract and Project Management for NNSA and Office of Environmental Management](#)

Director: Allison B. Bawden, Natural Resources and Environment

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

3. Planning for the Future of the Strategic Petroleum Reserve

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.

Recommendations: The Secretary of Energy should

- take actions to ensure that the agency periodically conducts and provides to Congress a strategic review of the Strategic Petroleum Reserve (SPR) that, 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;
- 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; and
- in completing DOE's ongoing study on the effects of congressionally mandated sales, consider a full range of options for handling potentially excess assets and, if needed, request congressional authority for the disposition of these assets.

Actions Needed: DOE agreed with our first recommendation and stated that a 5-year time interval between reviews was an appropriate time frame and would allow current strategic plans to be implemented and assessed. At the time, DOE officials told us that the department would complete a SPR Long-Term Strategic Review by the end of fiscal year 2021—5 years from the last review in 2016. However, as of March 2022, DOE had not finalized its review. To fully

address this recommendation, DOE needs to ensure that it undertakes a strategic review on a periodic basis going forward. Without addressing the limitations of its 2016 review and periodically performing reexaminations in the future, 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 respond to regional fuel supply disruptions. DOE stated that, given the inefficient and expensive nature of storing refined petroleum products in above-ground tanks, it would be an inappropriate use of taxpayer funds to conduct additional studies on the use of federal government-owned storage of refined petroleum products. However, the Quadrennial Energy Review of 2015 recommended that similar analyses be completed 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 needed to make decisions about regional product reserves. To address this recommendation, DOE needs to conduct the analyses.

DOE agreed with our third recommendation and has taken steps to implement it. However, as of March 2022, DOE had not finalized its analysis of options. To fully address this recommendation, DOE should complete the studies and provide the results to Congress. Without examining a full range of options for handling potentially excess reserve assets, DOE risks missing opportunities to modernize the SPR while saving taxpayer resources.

Director: Frank Rusco, Natural Resources and Environment

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

4. 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.

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 in its fiscal years 2020 and 2021 *Stockpile Stewardship and Management Plan* about its analysis of the affordability of its weapons modernization plans, the fiscal year 2022 *Stockpile Stewardship and Management Plan* did not include such analysis. According to the fiscal year 2022 plan, this was because no out-year budget projections were available on account of the administration's ongoing Nuclear Posture Review and development of a National Defense Strategy. To fully address our recommendation, NNSA should include assessments of the affordability of NNSA's 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

5. Address DOE's Environmental and Disposal Liability

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

Recommendation: The Secretary of Energy should direct DOE's Office of EM to develop a program-wide strategy that outlines how DOE will direct available resources to address human health and environmental risks across and within sites.

Actions Needed: DOE agreed with our recommendation. In its response to our report, DOE said that it was identifying and evaluating opportunities across the complex to reduce risk and life-cycle costs through more efficient and innovative approaches. In December 2021, DOE officials told GAO that EM was developing a program plan to evaluate cleanup alternatives at sites across the nation in an effort to reduce risk and life-cycle costs. However, as of May 2022, we had not received the plan. To fully address our recommendation, DOE needs to fully roll out a new program plan that outlines how the agency will direct available resources to address human health and environmental risks across and within sites. Without developing such a strategy that sets national priorities and describes how DOE will direct available resources to address the greatest human health and environmental risks across and within sites, EM cannot be assured that it is effectively setting priorities within and across sites.

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

Director: Nathan J. Anderson, Natural Resources and Environment

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

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

Recommendation: The Assistant Secretary for EM should develop a plan for mitigating the potential impacts of the risks to DOE's transuranic waste cleanup program posed by a potential interruption to waste disposal operations at the Waste Isolation Pilot Plant.

Actions Needed: DOE agreed with our recommendation. In May 2022, DOE stated that it is developing a national transuranic waste program recovery planning guide and that this guide will address our recommendation. According to DOE, this planning guide will be finalized in summer 2022. To fully address our recommendation, EM needs to finalize its planning guide

and we will review it at that time. By implementing our recommendation, DOE will be better able to effectively address these impacts, if such an interruption occurs.

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

Director: Allison B. Bawden, Natural Resources and Environment

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

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.

Recommendation: The Secretary of Energy should direct the Assistant Secretary of the Office 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. DOE said that it had engaged in mediated negotiations with the U.S. Environmental Protection Agency and Washington's Department of Ecology since June 2020 and that those actions addressed our recommendation. However, in March 2022, DOE told us that they were still engaged in negotiations. To fully address our recommendation, DOE must resolve the significant disagreement with the state Department of Ecology regarding how to address contamination in the soil under the Tri-Party Agreement, including what role NRC should play. By using an independent mediator to help it reach agreement with the state Department of Ecology on how to assess soil contamination, including NRC's role, DOE would be better positioned to avoid future cleanup delays.

Director: Nathan J. Anderson, Natural Resources and Environment

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

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.

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. On December 1, 2021, DOE issued a request for information on a consent-based siting process that it would use to identify sites to store the nation's spent nuclear fuel. The comment period ended on March 4, 2022; as of May 2022, DOE had not issued its evaluation of comments or clarified whether the outcome of this process will apply to consent-based siting for a deep geologic repository, as well as interim storage. To fully implement this recommendation, DOE needs to analyze the hundreds of comments it has received to inform an update to its draft consent-based siting process. Finalizing the draft could help position DOE to implement a consent-based process for selecting the locations of consolidated interim storage facilities and/or permanent geologic repositories, and ultimately

constructing these facilities, if Congress amends the Nuclear Waste Policy Act of 1982 to allow for storage and disposal options.¹²

Director: Frank Rusco, Natural Resources and Environment

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

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

Recommendation: The Secretary of Energy should direct the Assistant Secretary for EM to expand future analyses of potential disposal options to include all federal and commercial facilities that could potentially receive grouted supplemental low-activity waste from the Hanford site.

Action Needed: DOE agreed with this recommendation and stated that actions to implement it were in progress. DOE noted that it was considering disposal options analyzed by the Federally Funded Research and Development Center in coordination with the National Academies of Science, Engineering, and Medicine under Section 3125 of the National Defense Authorization Act for Fiscal Year 2021. DOE also stated that if it decided to pursue treatment of supplemental low-activity waste from Hanford using grout technology, it would evaluate reasonable disposal alternatives, in accordance with regulatory and other applicable requirements. To fully implement this recommendation, DOE needs to consider alternative disposal options that better reflect the relatively low risks that supplemental low-activity waste poses. By implementing this recommendation, DOE could save billions of dollars by pursuing less-expensive disposal options.

Director: Nathan J. Anderson, Natural Resources and Environment

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6. Improving Cybersecurity

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

¹²Pub. 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.: Sep. 23, 2021).

Action Needed: DOE did not explicitly agree or disagree with our recommendation. In early 2022, the agency took initial steps to determine framework adoption for the energy sector by tracking requests for a sector-based cybersecurity toolkit, assessing polling data, and obtaining anecdotal reports on framework use from sector entities. However, those efforts did not provide sufficient information for the agency to determine the level and type of framework adoption throughout the energy sector. DOE officials said that they were exploring additional strategies—such as leveraging data from trade associations and conducting additional feedback sessions with other groups—to obtain broader information across the sector. DOE is also exploring other steps to collect more information, such as learning new approaches to measuring adoption and engaging with national laboratories to report on sector usage of the framework and other derivative frameworks aligned with National Institute of Standards and Technology guidance. To fully implement this recommendation, DOE needs to implement these planned steps effectively 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.

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. In January 2022, DOE issued its Enterprise Cybersecurity Program Plan (E-CSPP), which outlines the department’s approach to cybersecurity risk management and the implementation of cybersecurity requirements from an organizational perspective. The plan further specifies that departmental elements may refer to and leverage the E-CSPP as a template to plan, refine, mature, and document their own cybersecurity programs.

The E-CSPP, along with DOE risk management amplification guidance, addresses most elements of a risk management strategy as identified in our report. However, neither the E-CSPP, nor most of the departmental element plans we reviewed, included a detailed discussion of organizational risk tolerance. As of April 2022, DOE had not provided additional documentation of its cybersecurity risk tolerance. In order to fully implement this recommendation, DOE should ensure that its plans provide such a discussion. Until it does so, the department 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.

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. In its response to our report, DOE stated that it was working through an interagency process to develop a *National Cyber Strategy Implementation Plan* that would consider DOE's *Multiyear Plan for Energy Sector Cybersecurity*. However, those documents do not fully address all of the key characteristics needed to implement a national strategy, such as fully assessing cybersecurity risks to the electricity grid. As of May 2022, DOE did not have an estimated date for issuing a report related to these efforts. While DOE considers its actions sufficient to close this recommendation, additional actions are needed. To fully address our recommendation, DOE should 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 ensures that it has a plan aimed at implementing the federal cybersecurity strategy relating to the grid that addresses all of the key characteristics of a national strategy—including a full assessment of cybersecurity risks—the guidance that the plan provides decision makers in allocating resources to address risks and challenges will likely be limited.

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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7. Worker Protections

Department of Energy: Whistleblower Protections Need Strengthening. [GAO-16-618](#). Washington, D.C.: July 11, 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, while DOE revised its Integrated Safety Management Policy 450.4A in January 2018 in response to our recommendation, the policy does not define the appropriate steps that DOE should take to hold

contractors accountable for creating a chilled work environment. As of April 2022, officials said that they were continuing to work on additional changes to the policy to address our recommendation. To fully address our recommendation, DOE should revise its safety management guidance to include the elements we recommended. By doing so, DOE will be better able to hold contractors accountable for addressing chilled work environments and to 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.

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 April 2022, DOE reported that it had implemented plans to address seven of 10 of its EEO program deficiencies relevant to sexual harassment. Additionally, NNSA reported that it had implemented plans to address two of three of its EEO program deficiencies relevant to sexual harassment. To fully address our recommendation, DOE should fully implement its plans to address its EEO program deficiencies relevant to sexual harassment and work with NNSA to fully implement these plans. Because the agencies have not fully implemented plans to address the identified deficiencies, they 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.

Director: Allison B. Bawden, Natural Resources and Environment

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8. Electricity Grid Resilience

Electricity Grid: Opportunities Exist for DOE to Better Support Utilities in Improving Resilience to Hurricanes. [GAO-21-274](#). Washington, D.C.: March 5, 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. In its response to our report, DOE stated that its Office of Electricity had recently formed an Energy Resilience Division dedicated to incorporating resilience concerns into DOE's work. This division established a Resilience Community of Practice, which meets monthly to discuss DOE's ongoing energy resilience projects and other resilience-related efforts. To support ongoing

resilience work, this division has also begun compiling a catalogue of existing resilience tools and models to better understand existing energy resilience planning capabilities and to identify gaps. Additionally, DOE's Office of Cybersecurity, Energy Security, and Emergency Response is establishing a plan of action for energy sector risk management. In May 2022, DOE officials told us that they aim to complete this plan by September 30, 2022. While DOE's efforts to identify existing resilience planning tools and potential gaps are steps in the right direction, to fully address our recommendation, DOE should 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.

Director: Frank Rusco, Natural Resources and Environment

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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 10, 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 June 2021, DOE stated that it had developed a grid resilience strategy in December 2020 under its Grid Modernization Initiative—a collaborative partnership of five DOE offices: Fossil Energy; Nuclear Energy; Electricity; Energy Efficiency and Renewable Energy; and Cybersecurity, Energy Security, and Emergency Response. According to DOE, the Grid Modernization Initiative strategy includes an all-hazards approach to characterize and implement system resilience but does not prioritize climate change over other threats. As of April 2022, DOE officials planned to update the Grid Modernization Initiative strategy in the summer of 2022 and use it as a framework for the department-wide strategy to coordinate its efforts. To fully address our recommendation, DOE should develop and implement a department-wide strategy to coordinate its efforts. The strategy should define goals and measure progress to enhance the resilience of the electricity grid to the risks of climate change. 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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