



April 10, 2019

The Honorable Rick Perry
Secretary
U.S. Department of Energy
1000 Independence Ave., SW
Room 7A-257
Washington, D.C. 20585

Priority Open Recommendations: Department of Energy

Dear Mr. Secretary:

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. In November 2018, we reported that on a government-wide basis, 77 percent of our recommendations made 4 years ago were implemented.¹ DOE's average recommendation implementation rate is 70 percent. As of January 2019, DOE had 135 open recommendations. Fully implementing these open recommendations could significantly improve agency operations.

Since our April 2, 2018 letter, DOE has not implemented any priority recommendations. However, we closed as not implemented one recommendation that we previously identified in our 2017 and 2018 letters on the quality of the National Nuclear Security Administration's (NNSA) financial and cost information, in part because NNSA did not implement it and it has been superseded by one of this year's additions. We ask your continued attention on the remaining 12 open priority recommendations we identified in the 2018 letter. This year, we are adding 6 new recommendations included in reports recently issued on management of the Strategic Petroleum Reserve and the Hanford cleanup project, improving financial information, and enhancing cybersecurity, bringing the total number of priority recommendations to 18. (See the enclosure for the list of these 18 recommendations.)

The 18 priority recommendations fall into the following 7 major areas.

Improve Project and Program Management. We have identified seven priority recommendations that would help improve DOE's management of its major projects and programs. Specifically, we identified four recommendations to improve DOE's management of projects. In May 2015, we made two recommendations on the Hanford Waste Treatment and Immobilization Plant project—DOE's largest and most complex project—first, to complete an extent-of-condition review, and second, to consider further limiting construction until risk mitigation strategies are developed to address technical challenges that have not been resolved. DOE has not fully implemented either recommendation. To fully address the recommendations, DOE should complete the review to identify any additional technical challenges and develop risk mitigation strategies.

¹GAO, *Performance and Accountability Report: Fiscal Year 2018*, [GAO-19-1SP](#) (Washington, D.C.: Nov. 15, 2018).

Also related to the Hanford Waste Treatment and Immobilization Plant project, we made a third recommendation in April 2018 that DOE revise the Office of River Protection's organizational structure so that the quality assurance function is independent of the office's upper management. DOE plans to assess the quality assurance function, which is a positive step. However, to fully address the recommendation, DOE should make appropriate changes to the Office of River Protection's organizational structure. Implementing our recommendations on the Waste Treatment and Immobilization Plant would strengthen management and oversight, as well as assurance of compliance with nuclear safety requirements, for a project with recently estimated remaining costs of \$239.9 billion to \$548.4 billion.

The fourth project management recommendation, which we originally made in June 2014, recommended that DOE take steps to reduce uncertainty about the expected cost and schedule of the U.S. share of the International Thermonuclear Experimental Reactor Project and its potential impact on the U.S. fusion program. Since it began in 2006, the estimated cost of the U.S. share of the project has grown by more than \$3 billion and its estimated completion date has slipped by more than 20 years. DOE has taken some actions, including approval of a performance baseline for a portion of the project in January 2017. To fully address the recommendation, DOE should approve a performance baseline for the entire project and communicate information on that baseline to Congress.

We identified three priority recommendations to strengthen DOE's management of programs. In November 2014, we made two recommendations that DOE revise directives to (1) require that DOE develop cost estimates for programs in accordance with best practices, including developing life-cycle cost estimates for programs and (2) ensure that program reviews are conducted periodically. To address these two recommendations, DOE should complete its revised budget formulation order, which DOE indicated would address requirements for program cost estimates and program reviews.

Regarding the third recommendation, in November 2016, we recommended that DOE establish a program management policy that addresses the responsibilities and authorities of program managers and that addresses leading program management practices, such as developing program plans. DOE indicated that to address the recommendation, the department needed to wait for the Office of Management and Budget (OMB) to adopt government-wide standards, policies, and guidelines for program management as required by the Program Management Improvement Accountability Act of 2016. In June 2018, OMB issued its guidance on implementing the act, which requires federal agencies to submit an implementation plan in 2019, among other actions. To fully address our recommendation, DOE should submit its implementation plan to OMB and address the other actions described in OMB's guidance. We note that in February 2019, NNSA issued its own directives addressing requirements for (1) managing programs that are not defined as either capital asset acquisitions or information technology acquisitions, and (2) conducting independent cost estimates for these programs. We are encouraged by these developments and will be assessing the extent to which these new directives address these three priority recommendations.

Improve Contract Management. We have identified two priority recommendations that would help improve DOE's oversight and management of contractors. Contract management is one of the highest risks facing the government, and aspects of DOE's contract management and administration have appeared on GAO's High Risk List since its inception in 1990. In May 2015, we recommended that NNSA establish comprehensive policies and guidance, beyond a general framework, for using information from contractor assurance systems to conduct oversight of management and operating contractors. As we noted in previous letters, NNSA has taken an

important step by approving a revised corporate site governance policy in August 2016. In addition, NNSA has since indicated that its field offices have been directed to modify local policies and procedures as necessary to accommodate the new policy. To fully address the recommendation, NNSA needs to develop guidance for using information from contractor assurance systems and appropriately balancing use of information from those systems with other, more direct activities to oversee management and operating contractors.

In July 2016, we recommended that DOE revise its safety management policy and guidance to clarify what constitutes evidence of a chilled work environment and define the appropriate steps DOE should take to hold contractors accountable for unlawful retaliation against whistle-blowers or creating a chilled work environment. Doing so would strengthen the department's oversight of contractors' efforts to maintain an open environment for raising safety or other concerns without fear of retaliation. In January 2018, DOE issued a revised safety management policy. The update to the policy is a positive step, but it is only a general policy statement. To fully address the recommendation, DOE should revise its safety management guidance that supports the policy to (1) clarify what constitutes evidence of a chilled work environment and (2) define the appropriate steps DOE should take to hold contractors accountable when DOE finds a contractor has created a chilled work environment.

Improve Financial and Cost Information. We identified two priority recommendations that would help DOE improve the quality of its financial and cost information. In March 2017, we recommended that DOE implement leading practices for managing the department's risk of fraud, including creating a dedicated entity within DOE to design and oversee fraud risk management activities. DOE responded to our recommendation by stating that it would rely on the existing Office of Financial Policy and Internal Controls and on the DOE Office of Inspector General to design and oversee financial fraud risk management activities. We disagree that reliance on these offices meets best practices for managing the risk of fraud because neither office is solely dedicated to designing or overseeing fraud risk management activities. Furthermore, according to best practices, the dedicated entity should not be the agency's office of inspector general. To fully address the recommendation, DOE should establish an entity solely dedicated to designing and overseeing fraud risk management activities and that is not the Office of Inspector General.

In January 2019, we recommended that NNSA implement a common work breakdown structure across its program offices, standardized at a high level to allow for program office customization but also to allow for the collection of total program costs. By dividing NNSA's work into standardized categories across program offices and sites, a common work breakdown structure would improve access to data and meet Congressional oversight needs. NNSA responded to our recommendation by stating that it would continue to use its current approach while focusing on enhancing analysis and reporting to provide comparative data across the enterprise. Once this is completed, NNSA said it would assess the effectiveness of the approach and evaluate what changes, if any, are necessary to the work breakdown structure to meet the overarching objectives of common financial reporting. While we are encouraged that NNSA will further assess and evaluate its effort, we strongly encourage the agency to implement a common work breakdown structure that is standardized at a level that allows for improved data across the nuclear security enterprise. This priority recommendation supersedes a previous priority recommendation on the quality of NNSA's financial and cost information that we identified in the 2017 and 2018 letters.

Strengthen Planning for the Future of the Strategic Petroleum Reserve. We identified three priority recommendations to strengthen planning for the future of the Strategic Petroleum

Reserve (SPR). The SPR was established more than four decades ago to reduce the impact of disruptions in supplies of petroleum products and, as of March 2018, held 665.5 million barrels of crude oil, worth about \$42 billion. In the decades since its creation, the structure of the SPR generally has not changed, though markets for crude oil and petroleum products have changed significantly. In May 2018, we recommended that DOE (1) conduct periodic strategic reviews of the SPR that take into account changes in crude oil and petroleum product market conditions and the costs and benefits of a wide range of SPR sizes, (2) conduct or complete studies on the costs and benefits of regional petroleum product reserves, and (3) consider a full range of options for handling potentially excess assets. To fully address these recommendations, DOE should complete the discussed reviews and studies and provide the results to Congress.

Address Nuclear Modernization Challenges. NNSA is carrying out an ambitious, costly, decades-long effort to modernize the nation's nuclear security enterprise, which includes ensuring that existing nuclear weapons remain safe and reliable and that aging and outdated weapons-related facilities are replaced or renovated. We have identified one priority recommendation that would help address challenges to this modernization effort. In April 2017, we recommended that NNSA include an assessment of the affordability of NNSA's portfolio of modernization programs in future versions of its *Stockpile Stewardship and Management Plan*.

Taking these additional steps to more fully discuss the affordability and priority of modernization programs would help congressional and NNSA decision makers better understand the potential trade-offs and rebalancing of priorities that may be needed to fit future budgets. The importance of implementing this recommendation is highlighted by the February 2018 Nuclear Posture Review and the President's fiscal year 2020 budget proposal, which called for additional modernization work and increased funding levels. To fully address the recommendation, NNSA should take actions to include an assessment of the affordability of NNSA's modernization programs in its *Stockpile Stewardship and Management Plan* that, for example, prioritizes programs to provide NNSA options for bringing the plans and funding needs for its portfolio of modernization programs into alignment with potential future budget estimates.

Address DOE's Environmental Liability. We made one priority recommendation that could potentially reduce cleanup costs that contribute to DOE's environmental liability. The federal government's environmental liability has been growing for the past 20 years and is likely to continue to increase. As such, we added the federal government's environmental liability to our High Risk List in February 2017. DOE is responsible for by far the largest share of this liability—\$384 billion of \$465 billion reported in fiscal year 2017. In addition, we have reported that DOE has not consistently taken a risk-informed approach to decision-making for environmental cleanup and may therefore be missing opportunities to reduce costs while also more quickly reducing environmental risks.

In May 2017, we recommended that DOE develop updated information on the effectiveness of treating and disposing of all the different portions of Hanford's supplemental low-activity waste with alternate methods or at alternate disposal sites and, based on this information, identify potential treatment and disposal pathways for different portions of the waste, considering the risks posed by the low-activity waste. DOE contracted with a federally funded research and development center to evaluate viable treatment options for the waste and expects a final report in mid-2019. To fully address the recommendation, DOE should ensure that the evaluation includes updated and comprehensive information on the effectiveness of treating and disposing of all the different portions of Hanford's supplemental low-activity waste with alternate methods and at alternate disposal sites. In addition, using the information developed by the research and development center, DOE should take steps to identify potential treatment and disposal pathways for different portions of the waste.

Address Aging Legacy Information Technology (IT) Systems and Cybersecurity. We made two priority recommendations to improve DOE's efforts to address IT acquisitions and cybersecurity. In May 2016, we recommended that a number of executive agencies, including DOE, take steps to identify and plan to modernize or replace legacy systems as needed, including time frames, activities to be performed, and functions to be replaced or enhanced. While OMB has not yet issued its guidance on legacy systems, the Report to the President on IT Modernization and the President's Management Agenda emphasize the need for agencies to identify and modernize legacy systems. To fully address the recommendation, DOE should establish a documented plan to modernize or replace its legacy systems in need of modernization. This plan should include time frames, activities to be performed, and functions to be replaced or enhanced, and should be consistent with OMB's draft guidance.

In February 2018, we recommended that the Secretary of Energy take steps to consult with respective sector partners, such as the sector coordinating council (SCC), Department of Homeland Security (DHS), and National Institute of Standards and Technology (NIST), as appropriate, to develop methods for determining the level and type of cybersecurity framework adoption by entities across their respective sector. DOE partially agreed with the recommendation and stated it planned to consult with sector partners on the development of methods for determining the level and type of NIST Framework adoption. DOE stated that it worked with stakeholders to better align the Cybersecurity Capability Maturity Model (C2M2) with the updated NIST Cybersecurity Framework but did not provide specific information regarding the adoption or use of the framework. To fully address the recommendation, DOE should have a more comprehensive understanding of the framework's use by sector entities if DOE, along with other entities, want to ensure that its facilitation efforts are successful and determine whether organizations are realizing positive results by adopting the framework.

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In March, we issued our biennial update to our high risk program, 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.² Our high-risk program has served to identify and help resolve serious weaknesses in areas that involve substantial resources and provide critical service to the public.

One of our high-risk areas, DOE's contract and project management for NNSA and the Office of Environmental Management, centers directly on DOE.³ Several other government-wide high-risk areas also have direct implications for DOE and its operations, including (1) addressing the U.S. government's environmental liability; (2) improving the management of IT acquisitions and operations; (3) improving strategic human capital management; (4) managing federal real property; and (5) ensuring the cybersecurity of the nation.⁴ We urge your attention to the DOE 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.

²GAO, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019).

³For a full discussion of the Contract and Project Management for NNSA and Office of Environmental Management high-risk area, see pages 217 through 221 of our 2019 high-risk report.

⁴For a full discussion of the U.S. Government's Environmental Liability, Management of IT Acquisitions and Operations, Strategic Human Capital Management, Managing Federal Real Property, and Ensuring the Cybersecurity of the Nation high-risk areas, see pages 138 through 142, 123 through 127, 75 through 77, 78 through 85, and 178 through 184, respectively, of our 2019 high risk report.

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, and Homeland Security and Governmental Affairs, United States Senate; and the Committees on Appropriations, Budget, and Oversight and Government Reform, House of Representatives. In addition, the report will be available at no charge 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 18 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 written in a cursive style with a large, prominent "D" and a long horizontal stroke at the end.

Gene L. Dodaro
Comptroller General
of the United States

Enclosure – 1

cc: Dan Brouillette, Deputy Secretary, Department of Energy
Lisa E. Gordon-Hagerty, Administrator, National Nuclear Security Administration

Enclosure

Priority Open Recommendations to the Department of Energy (DOE)

1. Improve Project and Program Management

Hanford Waste Treatment: DOE Needs to Evaluate Alternatives to Recently Proposed Projects and Address Technical and Management Challenges. [GAO-15-354](#). Washington, D.C.: May 7, 2015.

Recommendations: To improve DOE's management and oversight of the Hanford Waste Treatment and Immobilization Plant (WTP) project, the Secretary of Energy should

- in accordance with DOE's Office of River Protection quality assurance policy, conduct an extent-of-condition review for WTP's High Level Waste and Low Activity Waste facilities' systems that have not been reviewed by DOE; and
- consider whether or to what extent construction activities for the High Level Waste and Low Activity Waste facilities should be further limited until aggressive risk mitigation strategies are developed and employed to address technical challenges that DOE, the contractor, and others have identified but not yet resolved.

Actions Needed: DOE agreed with the recommendations. As of October 2018, DOE had developed and employed some risk mitigation strategies to address previously identified technical challenges but had not completed extent-of-condition reviews for all of the facilities' systems, and construction has continued without further limitation. To fully address the recommendations, DOE should complete extent-of-condition reviews for the remainder of WTP's High Level Waste and Low Activity Waste facilities' systems that have not been reviewed. In addition, DOE should consider whether or to what extent construction activities for those facilities should be further limited until these reviews are completed.

High-Risk Area: DOE's Contract Management for the National Nuclear Security Administration (NNSA) and Office of Environmental Management and U.S. Government's Environmental Liability

Director: David C. Trimble, Natural Resources and Environment

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

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: DOE agreed with the recommendation. In January 2017, DOE approved a performance baseline for the first plasma portion of the U.S. ITER Project and communicated that performance baseline to Congress. However, the performance baseline did not include the post-first plasma portion of the U.S. ITER Project. To fully address the recommendation, DOE should approve a performance baseline for the entire project and communicate information on that baseline to Congress.

Director: Frank Rusco, Natural Resources and Environment

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

Project and Program Management: DOE Needs to Revise Requirements and Guidance for Cost Estimating and Related Reviews. [GAO-15-29](#). Washington, D.C.: November 25, 2014.

Recommendations: To enhance NNSA's ability to develop reliable cost estimates for its projects and for its programs that have project-like characteristics, the Secretary of Energy should

- revise DOE directives that apply to programs to require that DOE and NNSA and its contractors develop cost estimates in accordance with the 12 cost estimating best practices, including developing life-cycle cost estimates for programs; and
- revise DOE requirements and guidance that apply to programs to ensure that program reviews are conducted periodically, including reviews of the life-cycle cost estimates for programs.

Actions Needed: DOE agreed with the recommendations. To address the recommendations, DOE should complete the planned revisions to its budget formulation order (DOE Order 130.1). According to DOE, the revised order, estimated for completion by September 30, 2019, will define and clarify requirements for program cost estimates and program reviews as well as specify how such reviews—to include lifecycle cost estimates—can best support the budget formulation process.

High-Risk Area: DOE's Contract Management for NNSA and Office of Environmental Management

Director: David C. Trimble, Natural Resources and Environment

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

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

Recommendation: To help ensure that NNSA effectively manages the performance of its programs, the Secretary of Energy should establish a program management policy that (1) assigns responsibilities and delegates authority to program managers and establishes expectations of competence for them, in accordance with federal internal control standards, and (2) addresses leading program management practices, such as developing program plans.

Action Needed: DOE did not comment on the recommendation. Subsequently, DOE stated that it would address our recommendation after the Office of Management and Budget (OMB) adopts government-wide standards, policies, and guidelines for program

and project management for agencies, as required by the Program Management Improvement Accountability Act of 2016. In June 2018, OMB issued guidance on implementing the act, which requires federal agencies to submit an implementation plan in 2019, among other actions. To fully address our recommendation, DOE should submit its implementation plan to OMB and address the other actions described in OMB's guidance.

High-Risk Area: DOE's Contract Management for NNSA and Office of Environmental Management

Director: David C. Trimble, Natural Resources and Environment

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

Hanford Waste Treatment Plan: DOE Needs to Take Further Actions to Address Weaknesses in Its Quality Assurance Program. [GAO-18-241](#). Washington, D.C.: April 24, 2018.

Recommendation: The Secretary of Energy should revise the Office of River Protection's (ORP) organizational structure so that the quality assurance function is independent of ORP upper management.

Action Needed: DOE agreed with the recommendation in principle. While DOE states that it believes that the current ORP quality assurance reporting relationship meets all established requirements, it also states that the report identifies instances that indicate that ORP's independence could be strengthened to improve the effectiveness of its quality assurance functions. As of October 2018, DOE had taken actions to direct ORP to assess the quality assurance functional reporting lines, responsibilities, and processes to enhance the independence of the quality function from cost and schedule influences and to strengthen and clarify quality assurance reporting to the ORP Manager. To fully address this recommendation, DOE should make appropriate changes to ORP's organizational structure.

High-Risk Area: DOE's Contract Management for NNSA and Office of Environmental Management

Director: David C. Trimble, Natural Resources and Environment

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

2. Improve Contract Management

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.

Recommendation: To improve the internal control environment for oversight using information from contractor assurance systems (CAS) and develop a consistent approach to the use of information from CAS in management and operating contractor oversight and performance evaluation across the nuclear security enterprise, the Administrator of the NNSA should establish comprehensive NNSA policies and guidance, beyond a general framework as included in NNSA Policy-21, for using information from CAS to conduct oversight of M&O contractors, clarifying whether CAS

is to cover mission-related activities, and describing how to conduct assessments of risk, CAS maturity, and the level of the contractor's past performance.

Action Needed: NNSA agreed with the recommendation. In August 2016, NNSA approved a revised corporate site governance policy, Supplemental Directive 226.1B, that improves on the agency's prior policy by clarifying one element in our recommendation that CAS is to cover mission-related activities. However, the policy is still a general framework, and NNSA has not established associated implementing guidance. To fully address the recommendation, NNSA needs to develop guidance for using information from CAS and appropriately balancing use of information from CAS with other, more direct activities to oversee M&O contractors.

High-Risk Area: DOE's Contract 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

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 (ISM) policy and guidance to clarify what constitutes evidence of a chilled work environment and define the appropriate steps DOE should take to hold contractors accountable for creating a chilled work environment.

Actions Needed: DOE agreed with the recommendation. In January 2018, DOE issued a revision to DOE Policy 450.4A. The revised policy states that organizations should foster a culture that allows employees to "feel free to raise safety concerns to management without fear of retaliation...and supporting a questioning attitude concerning safety by all employees." However, the policy does not define the appropriate steps DOE should take to hold contractors accountable for creating a chilled work environment. To fully address the recommendation, DOE should revise its ISM guidance that supports the policy to define appropriate steps for holding contractors accountable.

High-Risk Area: DOE's Contract Management for NNSA and Office of Environmental Management

Director: David C. Trimble, Natural Resources and Environment

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

3. Improve Financial and Cost Information

Department of Energy: Use of Leading Practices Could Help Manage the Risk of Fraud and Other Improper Payments. [GAO-17-235](#). Washington, D.C.: March 30, 2017.

Recommendation: To help DOE take a more strategic approach to managing improper payments and risk, including fraud risk, the Secretary of Energy should implement leading practices for managing the department's risk of fraud, including

creating a structure with a dedicated entity within DOE to design and oversee fraud risk management activities.

Actions Needed: DOE partially agreed with the recommendation. In written responses to our report, DOE stated that it considers the recommendation to be closed without corrective action and that it would rely on the existing Office of Financial Policy and Internal Controls and on the DOE Office of Inspector General (OIG) to design and oversee financial fraud risk management activities. We disagree that reliance on these offices meets best practices because neither office is solely dedicated to designing or overseeing fraud risk management activities. Furthermore, according to the best practices in GAO's Fraud Risk Framework, the dedicated entity should not be the OIG. To fully address the recommendation, DOE should establish an entity solely dedicated to designing and overseeing fraud risk management activities and that is not the OIG.

High-Risk Area: DOE's Contract 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

National Nuclear Security Administration: Additional Actions Needed to Collect Common Financial Data. [GAO-19-101](#). Washington, D.C.: January 31, 2019.

Recommendation: The NNSA Administrator should implement a common work breakdown structure across NNSA program offices in the nuclear security enterprise, standardized at a high level to allow for program office customization but also to allow for the collection of total program costs.

Action Needed: NNSA neither agreed nor disagreed with the recommendation. In its written responses to our report, NNSA stated that it would continue to use its current approach while focusing on enhancing analysis and reporting to provide comparative data across the enterprise. Once this is completed, NNSA said it would assess the effectiveness of the approach and evaluate what changes, if any, are necessary to the work breakdown structure to meet the overarching objectives of common financial reporting. To fully address the recommendation, we strongly encourage the agency to implement a common work breakdown structure that is standardized at a level that allows for improved data across the nuclear security enterprise.

High-Risk Area: DOE's Contract 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

4. Strengthen 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, 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;
- 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 the recommendations to periodically conduct strategic reviews and consider a full range of options for handling potentially excess assets. However, DOE disagreed with the recommendation to conduct or complete studies on the costs and benefits of regional petroleum product reserves because the agency's position is that government-owned and -operated regional petroleum product reserves are an inefficient and expensive solution to respond to regional fuel supply disruptions. However, the Quadrennial Energy Review of 2015 recommended that similar analyses be completed for other areas deemed by DOE to be vulnerable to fuel supply disruptions. Therefore, we continue to believe that conducting these analyses, as recommended in the Quadrennial Energy Review of 2015, will provide Congress with information needed to make decisions about regional product reserves. To fully address these recommendations, DOE should complete the discussed reviews and studies and provide the results to Congress.

Director: Frank Rusco, Natural Resources and Environment

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

5. Address 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 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 the recommendation. To address the recommendation, NNSA should include in future versions of the *Stockpile Stewardship and Management Plan* an assessment of the affordability of NNSA's portfolio of nuclear modernization programs. The affordability assessment could discuss options NNSA could consider to bring the plans and funding needs for its portfolio of modernization programs into alignment with potential future budget estimates. This could include determining which programs should receive the highest

priority and identifying programs for cancellation or deferral in consultation with the Department of Defense and the military services so as to ensure an affordable modernization program.

Director: Allison B. Bawden, Natural Resources and Environment

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6. Address DOE's Environmental Liability

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.

Recommendation: To help ensure that DOE's treatment of Hanford's supplemental low-activity waste (LAW) is risk-based and cost-effective, the Secretary of Energy should develop updated information on the effectiveness of treating and disposing of all the different portions of Hanford's supplemental LAW with alternate methods or at alternate disposal sites and, based on this information, identify potential treatment and disposal pathways for different portions of Hanford's supplemental LAW, considering the risks posed by the LAW. In implementing this recommendation, DOE should take into account the results of the analysis required by Section 3134 of the National Defense Authorization Act for Fiscal Year 2017.

Actions Needed: DOE agreed with the recommendation. DOE's Office of River Protection contracted with Savannah River National Laboratory, a federally funded research and development center, to evaluate viable treatment options for supplemental LAW. Savannah River National Laboratory and the National Academies of Sciences, Engineering and Medicine provided a draft report in July 2018 and plan to issue a final report in mid-2019 that includes information DOE may be able to use in making a decision about treating supplemental LAW. According to DOE officials, the National Academies started conducting a peer review of the laboratory's evaluation and held three public meetings on the subject. In addition, in response to GAO's recommendation, as of July 2018 DOE was demonstrating the feasibility of grouting, transporting, and disposing of 2,000 gallons of Hanford's LAW at an alternate disposal site in Andrews, Texas. According to DOE, this demonstration project is planned to be completed in fiscal year 2019 and could provide an alternate option for treatment and disposal of Hanford's LAW. Moreover, DOE noted that the project has the potential to accelerate waste treatment and save significant costs. To fully address the recommendation, DOE should ensure that the evaluation includes updated and comprehensive information on the effectiveness of treating and disposing of all the different portions of Hanford's supplemental LAW with alternate methods and at alternate disposal sites. In addition, using the information developed by Savannah River National Laboratory, DOE should take steps to identify potential treatment and disposal pathways for different portions of Hanford's supplemental LAW, considering the risks posed by the LAW.

High-Risk Area: U.S. Government's Environmental Liability

Director: David C. Trimble, Natural Resources and Environment

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7. Address Aging Legacy Information Technology (IT) Systems and Cybersecurity

Information Technology: Federal Agencies Need to Address Aging Legacy Systems. GAO-16-468. Washington, D.C.: May 25, 2016.

Recommendation: To address obsolete IT investments in need of modernization or replacement, the Secretary of Energy, among others, should direct their respective agency Chief Information Officers to identify and plan to modernize or replace legacy systems as needed and consistent with OMB's draft guidance, including time frames, activities to be performed, and functions to be replaced or enhanced.

Action Needed: DOE partially agreed with the recommendation. Specifically, DOE agreed to continue to take steps to modernize its legacy IT systems, as needed and as funding is available. Because OMB had not yet issued its final guidance on modernizing legacy IT systems, DOE could not concur with that part of the recommendation. While OMB has not yet issued its guidance on legacy systems, the Report to the President on IT Modernization and the President's Management Agenda emphasize the need for agencies to identify and modernize legacy systems. As such, we continue to believe that DOE should implement our recommendation and identify and plan to replace or modernize legacy systems, including establishing a plan that includes time frames, activities to be performed, and functions to be replaced or enhanced. To fully address the recommendation, DOE should establish a documented plan to modernize or replace its legacy systems in need of modernization, and this plan should include time frames, activities to be performed, and functions to be replaced or enhanced, and should be consistent with OMB's draft guidance.

High-Risk Area: Improving the Management of IT Acquisitions and Operations

Director: Carol C. Harris, Information Technology Management Issues

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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 partner(s), such as the sector coordinating council (SCC), Department of Homeland Security (DHS), and National Institute of Standards and Technology (NIST), 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 the recommendation. In its April 2018 letter, DOE stated it planned to consult with sector partners on the development of methods for determining the level and type of NIST Framework adoption as part of updating its Cybersecurity Capability Maturity Model (C2M2) tool in 2018. In August 2018, DOE held a meeting of the C2M2 Working Group, which includes industry partners from the electricity, oil, and natural gas subsectors; DHS; and NIST. DOE stated that it worked with stakeholders to better align the C2M2 with the updated NIST Cybersecurity Framework but did not provide specific information regarding the adoption or use of the framework. As such, a more comprehensive understanding of the framework's use by sector entities is necessary if DOE, along with other entities, wants to ensure that its facilitation efforts are successful and determine whether organizations are realizing positive results by adopting the framework.

High-Risk Area: Ensuring the Security of Federal Information Systems and Cyber Critical Infrastructure and Protecting the Privacy of Personally Identifiable Information

Director: Nick Marinos, Cybersecurity and Information Management Issues

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