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Comptroller General  
of the United States

April 10, 2020

The Honorable Kristine Svinicki  
Chairman  
U.S. Nuclear Regulatory Commission (NRC)  
Washington, D.C. 20555-0001

**Priority Open Recommendations: Nuclear Regulatory Commission**

Dear Chairman Svinicki:

The purpose of this letter is to provide an update on the overall status of the Nuclear Regulatory Commission's (NRC) implementation of GAO's recommendations and to call your personal attention to areas where open recommendations should be given high priority.<sup>1</sup> In November 2019, we reported that on a government-wide basis, 77 percent of our recommendations made 5 years ago were implemented.<sup>2</sup> NRC's recommendation implementation rate was 67 percent. As of March 2020, NRC had 26 open recommendations. Fully implementing these open recommendations could significantly improve agency operations.

Since our last letter in April 2019, NRC has not implemented any priority recommendations. We ask your continued attention to the four open priority recommendations we identified in the 2019 letter. This year, we are adding three new recommendations included in reports recently issued on combating nuclear terrorism and cybersecurity risk management programs, bringing the total number of priority recommendations to seven. For example, we are adding a recommendation that NRC consider socioeconomic consequences and fatalities from evacuations as criteria for determining security measures for radioactive materials dispersed through a radiological dispersal device. (See enclosure for the list of these recommendations.)

The seven priority recommendations fall into the following four major areas.

**Addressing the Security of Radiological Sources.** Four recommendations would improve NRC's ability to ensure the secure use of radiological sources.

Our July 2016 report on controls of dangerous materials contains two priority recommendations regarding licensing and accountability strategies for dangerous (category 3) quantities of radioactive material, and our April 2019 report on combating nuclear terrorism contains one related priority recommendation. Specifically, in 2016 we recommended that (1) NRC take steps to include category 3 radioactive material and possession licenses in two databases as quickly as possible and (2) require that transferors of category 3 quantities of radioactive material confirm the validity of a would-be purchaser's license with the appropriate regulatory authority

<sup>1</sup>Priority 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 operation, for example, by realizing large dollar savings; eliminating mismanagement, fraud, and abuse; or making progress toward addressing a high-risk or duplication issue.

<sup>2</sup>GAO, *Performance and Accountability Report: Fiscal Year 2019*, GAO-20-1SP (Washington, D.C.: Nov. 19, 2019).

before transferring such materials. In April 2019 we recommended that NRC require additional security measures for certain quantities of category 3 radioactive material and assess whether other category 3 quantities of material should also be safeguarded with additional security measures.

NRC told us that it continues to consider actions to address these three recommendations, but NRC has not implemented the recommendations. In August 2017, NRC staff completed a staff analysis on these topics; however, the analysis recommended that the NRC Commission not implement the recommendations from our 2016 report. The NRC staff determined that the threat, vulnerability, and consequence data do not justify the cost associated with regulatory changes. Specifically, NRC assesses the risks of radioactive material based on the potential of that material to cause prompt fatalities and deterministic health effects from radiation. However, according to 18 experts at a meeting GAO convened with the National Academies of Sciences and two studies from Sandia National Laboratories, these consequences are unlikely to result from a radiological dispersal device (RDD). Furthermore, the experts generally agreed that the NRC assessment of risks of radioactive material does not include all relevant criteria, including the omission of socioeconomic consequences and fatalities from evacuations. The two Sandia studies found that a large RDD could cause about \$30 billion in damage and 1,500 fatalities from the evacuation, and a considerably smaller RDD could cause \$24 billion in damage and 800 fatalities from the evacuation. We believe that implementing our recommendations would provide greater assurance that a bad actor could not manipulate the system by, for example, altering a paper license to acquire radioactive materials in aggregate greater than what they are authorized to possess. Additionally, NRC staff have not updated this analysis to incorporate new information in response to our April 2019 report and recommendation on these topics. We encourage NRC to continue actions to address these recommendations.

In addition to the three recommendations described above, our April 2019 letter had one additional priority recommendation on considering socioeconomic consequences and fatalities from evacuations as criteria for determining security measures for radioactive materials dispersed through a radiological dispersal device. NRC disagreed with this recommendation maintaining that the current regulatory requirements provide for the safe and secure use of all radioactive materials, regardless of category. We disagree with NRC's assessment. Our April 2019 report, in combination with our previous reports on this topic, demonstrate that there are vulnerabilities in current NRC security requirements such as the risk of theft or misuse of these materials and that the potential consequences of misusing these materials could be significant. We encourage NRC to take action to implement this recommendation.

**Improving the Reliability of Cost Estimates.** One recommendation would improve the reliability of NRC's cost estimates and better ensure that Commissioners have adequate information on which to base their regulatory decisions. In our December 2014 report, we found that NRC's procedures did not adequately support the development of reliable cost estimates, and we recommended that NRC align its cost estimating procedures with relevant best practices identified in the *GAO Cost Estimating and Assessment Guide*.<sup>3</sup> NRC issued a draft of its updated cost estimating procedures for comment in April 2017, and NRC staff further updated the draft in January 2020 to conform with agency-wide directives. However, NRC has not issued the final procedures. To fully implement this recommendation, NRC needs to complete and issue its updated cost estimating procedures.

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<sup>3</sup>GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

**Improving Strategic Human Capital Management.** One recommendation would help NRC better plan for its future workload. NRC significantly expanded its workforce to meet the demands of an anticipated increase in workload to license new reactors that ultimately did not occur. We recommended in our April 2017 report that NRC set agency-wide goals for its overall workforce size and composition that extend beyond the 2-year budget cycle. In 2019, NRC completed an enhanced strategic workforce planning process; as a part of that process, NRC forecast the anticipated workload and associated skill sets needed to perform agency work. While NRC has made progress in this area, to fully implement our recommendation, NRC needs to ensure that it sets goals—which could be ranges—for the size and composition of its workforce.

**Ensuring the Cybersecurity of the Nation.** One recommendation would help NRC better position itself to make consistent, informed, risk-based decisions in protecting its systems and information against cyber threats. Federal agencies face cyber threats that continue to grow in number and sophistication. Without developing an agency-wide cybersecurity risk management strategy, agencies may lack a consistent approach to managing cybersecurity risks. We recommended in our July 2019 report that NRC develop a cybersecurity risk management strategy that includes the key elements identified in our report that are foundational to effectively managing cybersecurity risks. NRC plans to assess our findings and update its agency policy by the end of fiscal year 2020. We will continue to monitor NRC's efforts to address our recommendation.

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As you know, in March 2019, 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.<sup>4</sup> Our high-risk program has served to identify and help resolve serious weaknesses in areas that involve substantial resources and provide critical services to the public.

Several government-wide high-risk areas have direct implications for NRC and its operations. These include (1) [the government-wide personnel security clearance process](#), (2) [ensuring cybersecurity of the nation](#), (3) [improving management of IT acquisitions and operations](#), (4) [strategic human capital management](#), and (5) [managing federal real property](#).<sup>5</sup> We urge your attention to the government-wide high-risk issues as they relate to NRC. Progress on high-risk issues has been possible through the concerted actions and efforts of Congress, the Office of Management and Budget (OMB), and the leadership and staff in agencies, including NRC.

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 Reform, House of Representatives. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

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<sup>4</sup>GAO, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019).

<sup>5</sup>[GAO-19-157SP](#). See pages 170-177 for Government-wide Personnel Security Clearance Process, pages 178-184 for Ensuring the Cybersecurity of the Nation, pages 123-127 for Improving the Management of IT Acquisitions and Operations, pages 75-77 for Strategic Human Capital Management, and pages 78-85 for Managing Federal Real Property.

I appreciate NRC'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 [GaffiganM@gao.gov](mailto:GaffiganM@gao.gov) or (202) 512-3841. 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 26 open recommendations. 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, stylized initial "G".

Gene L. Dodaro  
Comptroller General  
of the United States

Enclosure - 1

cc: The Honorable Mick Mulvaney, Director, Office of Management and Budget

Enclosure

## Priority Open Recommendations to the Nuclear Regulatory Commission

### Addressing the Security of Radiological Sources

*Nuclear Security: NRC Has Enhanced the Controls of Dangerous Radioactive Materials, but Vulnerabilities Remain.* [GAO-16-330](#). Washington, D.C.: July 1, 2016.

**Recommendation:** Because some quantities of radioactive materials are potentially dangerous to human health if not properly handled, the Nuclear Regulatory Commission (NRC) should take action to better track and secure these materials and verify the legitimacy of the licenses for those who seek to possess them. Specifically, the NRC should take the steps needed to include category 3 sources in the National Source Tracking System and add agreement state category 3 licenses to the Web-based Licensing System as quickly as reasonably possible.

**Actions Needed:** NRC neither explicitly agreed nor disagreed with this recommendation but stated that it would consider our recommendation as part of a working group the agency has established. In August 2017, the working group provided a staff analysis on these issues to the Commission and recommended neither including category 3 sources in the National Source Tracking System nor adding agreement state category 3 licenses to the Web-based Licensing System. We continue to believe that implementing our recommendation would provide greater assurance that a bad actor could not manipulate the system by, for example, altering a paper license to acquire radioactive materials in aggregate greater than what they are authorized to possess. We encourage NRC to continue actions to address this recommendation.

**Recommendation:** Because some quantities of radioactive materials are potentially dangerous to human health if not properly handled, NRC should take action to better track and secure these materials and verify the legitimacy of the licenses for those who seek to possess them. Specifically, the NRC should at least, until such time that category 3 licenses can be verified using the License Verification System, require that transferors of category 3 quantities of radioactive materials confirm the validity of a would-be purchaser's radioactive materials license with the appropriate regulatory authority before transferring any category 3 quantities of licensed materials.

**Actions Needed:** NRC neither explicitly agreed nor disagreed with this recommendation but stated that it would consider our recommendation as part of a working group the agency has established. In August 2017, the working group provided staff analysis on these issues to the Commission and recommended against requiring transferors of category 3 quantities of radiological material to confirm the validity of licenses before transferring any category 3 quantities of these materials. We continue to believe that implementing our recommendation would provide greater assurance that a bad actor could not manipulate the system by, for example, altering a paper license to acquire radioactive materials in aggregate greater than what they are authorized to possess. We encourage NRC to take action to implement this recommendation.

*Combating Nuclear Terrorism: NRC Needs to Take Additional Actions to Ensure the Security of High-Risk Radioactive Material.* [GAO-19-468](#). Washington, D.C.: April 4, 2019.

**Recommendation:** The Chairman of NRC should require additional security measures for high-risk quantities of certain category 3 radioactive material and assess whether other category 3 materials should also be safeguarded with additional security measures.

**Actions Needed:** NRC neither explicitly agreed nor disagreed with this recommendation but stated that it would consider our recommendation as part of a working group the agency has established. The working group provided a staff analysis on these issues to the Commission in August 2017, but NRC has not updated this analysis taking into account the new information we provided in our April 2019 report. We continue to believe that implementing our recommendation would provide greater assurance that NRC's requirements are sufficient to help ensure all high-risk radioactive material are protected from theft and use in a radiological dispersal device (RDD). We encourage NRC to take action to implement this recommendation.

**Recommendation:** The Chairman of NRC should direct NRC staff to consider socioeconomic consequences and fatalities from evacuations in the criteria for determining what security measures should be required for radioactive materials that could be used in an RDD.

**Actions Needed:** NRC disagreed with this recommendation, maintaining that the current regulatory requirements provide for the safe and secure use of all radioactive materials, regardless of category. We disagree with NRC's assessment. We continue to believe that by implementing our recommendation NRC would have better assurance that it considers more likely and more significant consequences of an RDD when establishing its security requirements for this material. We encourage NRC to take action to implement this recommendation.

**Director:** David Trimble, Natural Resources and Environment

**Contact Information:** [TrimbleD@gao.gov](mailto:TrimbleD@gao.gov), (202) 512-3841

## Improving the Reliability of Cost Estimates

*Nuclear Regulatory Commission: NRC Needs to Improve Its Cost Estimates by Incorporating More Best Practices.* [GAO-15-98](#). Washington, D.C.: December 12, 2014.

**Recommendation:** To improve the reliability of its cost estimates, as NRC revises its cost estimating procedures, the NRC Chairman should ensure that the agency aligns the procedures with relevant cost estimating best practices identified in the *GAO Cost Estimating and Assessment Guide* and ensure that future cost estimates are prepared in accordance with relevant cost estimating best practices.<sup>6</sup>

**Actions Needed:** NRC generally agreed with the recommendation. NRC has taken action by updating a draft of its cost estimating procedures in January 2020 and providing it to the NRC Commission for its review. To fully implement this recommendation, NRC needs to issue its update to its cost estimating procedures to align with best practices identified in our cost estimating guide.

**Director:** Frank Rusco, Natural Resources and Environment

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<sup>6</sup>GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March 2009).

## Improving Strategic Human Capital Management

*Strategic Human Capital Management: NRC Could Better Manage the Size and Composition of Its Workforce by Fully Incorporating Leading Practices.* [GAO-17-233](#). Washington, D.C.: April 27, 2017.

**Recommendation:** To improve NRC's ability to strategically manage the size and composition of its workforce and respond to changes in the nuclear industry, the Chairman of the Nuclear Regulatory Commission should set agency-wide goals, which could be ranges, for overall workforce size and skills composition that extend beyond the 2-year budget cycle.

**Actions Needed:** NRC generally agreed with the recommendation. NRC has completed some efforts to improve planning such as completing its enhanced strategic workforce planning pilot and forecasting some workload and skill set needs on a 5-year time frame. To fully implement this recommendation, NRC needs to use the information from this pilot to develop agency-wide goals for the workforce size and skills composition that extend beyond the 2-year budget cycle.

### High-Risk Area: [Strategic Human Capital Management](#)

**Director:** Frank Rusco, Natural Resources and Environment

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## Ensuring the Cybersecurity of the Nation

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

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

**Actions Needed:** NRC generally agreed with the recommendation. NRC acknowledged there are gaps in its cybersecurity risk management strategy based on the key elements we identified in our report, such as a statement of risk tolerance. NRC is assessing our findings and plans to update its agency policy by the end of fiscal year 2020. To fully implement this recommendation, NRC needs to update its cybersecurity risk management strategy to include all key elements we identified in our report.

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

**Director:** Nick Marinos, Information Technology and Cybersecurity

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