



G A O

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United States Government Accountability Office
Washington, DC 20548

April 30, 2009

Congressional Requesters

Subject: *Nuclear Forensics: Comprehensive Interagency Plan Needed to Address Human Capital Issues*

The detonation of a nuclear weapon or radiological dispersal device (RDD) in the United States or elsewhere would cause decision makers to immediately demand information on the nature of the device—including its design, the materials used to build it, and the materials' source—as well as the identification of the perpetrators. Technical nuclear forensics—the analysis of nuclear or radiological materials that are intercepted or the radioactive debris and prompt output signals (such as gamma rays) produced by a nuclear event—can contribute to the identification of the sources of these materials and the processes used to create them. Analytical techniques developed to determine the nature of nuclear tests can be used if terrorists were to detonate a nuclear device or RDD and radioactive debris samples were recovered (known as “postdetonation” nuclear forensics). Nuclear forensic techniques also could potentially be used to determine the origin of nuclear or radiological materials or devices seized prior to their use in a weapon (known as “predetonation” nuclear forensics). The U.S. government's predetonation nuclear forensics capabilities have been demonstrated in investigations on seized nuclear material from illicit smuggling operations. In addition, it is important to note that nuclear forensics represents a key piece of the overall effort to identify specific perpetrators of a nuclear event, in a process known as *attribution*. The combination of nuclear forensics conclusions, law enforcement findings (e.g., traditional forensics, such as fingerprint analysis), and intelligence information can be used to attribute an event to specific perpetrators.

The departments of Defense (DOD), Energy (DOE), Homeland Security (DHS), and State (State), as well as the Federal Bureau of Investigation (FBI) and the intelligence community, would play key roles in a nuclear forensics investigation. The specific roles these agencies would play were established in August 2007 through a presidential decision directive. This directive also formally established the National Technical Nuclear Forensics Center (NTNFC) within DHS's Domestic Nuclear Detection Office to coordinate planning, integration, assessment, and stewardship of the U.S. government's nuclear forensics capabilities. NTNFC has chartered a number of interagency groups to guide policy making for the National Technical Nuclear Forensics (NTNF) program and has led the development of key interagency documents such as the NTNF strategic plan.

In this context, you asked us to assess the (1) challenges the U.S. government faces in developing and maintaining a comprehensive nuclear forensics capability and (2) current and future costs associated with the U.S. government's nuclear forensics efforts. In February 2009, we reported to you on the results of our work in a classified report.¹ This letter summarizes certain aspects of our classified report.

To address these objectives, we reviewed program documents and interviewed officials from DOD; DOE; DHS; State; FBI; the Office of the Director of National Intelligence; the Executive Office of the President and, within that office, the Homeland Security Council and the Office of Science and Technology Policy; the Nuclear Regulatory Commission (NRC); the International Atomic Energy Agency (IAEA); and eight DOE national laboratories that support the NTNF program. We visited four of these national laboratories: Lawrence Livermore, Los Alamos, Pacific Northwest, and Savannah River—as well as a DOD facility involved in nuclear forensics. In addition, we observed part of the October 2008 interagency nuclear forensics exercise at Ft. Bragg, North Carolina. Regarding our examination of challenges facing the NTNF program, we reviewed program documentation, including a report from NTNFC's 2008 workshop on the national laboratories' human capital requirements for nuclear forensics and surveys on the NTNF program's manpower needs. We also reviewed documents from and had discussions with six professors from five universities that award Ph.D. degrees for study in radiochemistry. To select those professors, we used a judgmental sample of academicians from major university programs that grant Ph.D. degrees in radiochemistry. To assess the current and expected budget for nuclear forensics activities, we met with officials from DOD, DOE, DHS, State, and FBI to review budget information from the NTNF program. We discussed and reviewed these data with budget and program analysts at these agencies. In addition, we interviewed knowledgeable officials on the reliability of these data, including issues such as data entry, access, quality control procedures, and the accuracy and completeness of the data. We determined that these data were sufficiently reliable for purposes of this review.

We conducted the work for the classified report between January 2008 through February 2009 in accordance with generally accepted government auditing standards, and we conducted our work for the unclassified report in accordance with the same standards between March 2009 and April 2009. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Summary

Agencies implementing the NTNF program face challenges in reducing the time needed to arrive at nuclear forensics conclusions and addressing human capital shortages in key disciplines—such as radiochemistry—needed for nuclear forensics. Agencies are working to significantly reduce the time needed to collect, transport,

¹GAO, (U) *Nuclear Forensics: U.S. Efforts Hampered by Equipment, Infrastructure, and Personnel Deficiencies, and a Lack of Baseline Program Requirements*, GAO-09-276C (Washington, D.C.: Feb. 25, 2009).

and analyze nuclear forensics samples after an event. For example, DOD has supported a variety of research and development efforts to make sample collection more efficient. In addition, DOE national laboratories are engaged in research and development initiatives to automate laboratory techniques used to analyze radioactive samples and to modernize aging equipment. With regard to human capital challenges, agencies lack a comprehensive interagency plan to guide their efforts. DHS has led interagency efforts to promote the development of trained nuclear forensics experts, including funding summer schools and internships. However, the agency has not fully assessed the demand for these specialists from competing areas outside the NTNF program, such as private industry. In addition, DHS-led efforts to promote radiochemistry have not been well coordinated with similar programs at DOE and NRC. To address the human capital challenges facing the program, we are recommending that DHS work with other agencies to develop a comprehensive interagency plan.

According to DHS, agencies implementing the NTNF program planned to spend about \$60 million and \$59 million in fiscal years 2008 and 2009, respectively, but the future budgetary needs to support the program are unknown. Regarding current program costs, the projected spending total DHS provided underestimates the program's true costs because it does not include costs associated with many DOD, DOE, and State programs that are critical to supporting nuclear forensics. The long-term future budget for the NTNF program is undetermined, in part, because agencies have not developed a plan to mitigate any possible reductions in the funding streams for activities that currently pay for the infrastructure, equipment, and personnel upon which the nation's nuclear forensics capabilities depend. We are recommending that agencies more fully account for the amounts spent on other DOD, DOE, and State efforts that the NTNF program relies upon and take steps to mitigate potential effects of budget reductions for these efforts.

We provided a draft of our classified report to DOD, DOE, DHS, FBI, NRC, the Office of the Director of National Intelligence, State, and the Executive Office of the President. DOD and NRC provided written comments, the unclassified portions of which can be found in enclosures I and II, respectively. The Office of the Director of National Intelligence and State also provided classified written comments, which cannot be included in this report. As discussed in our classified report, DOD and State concurred with our recommendations and NRC and the Office of the Director of National Intelligence did not comment on our recommendations. DOD, DOE, FBI, and the Office of the Director of National Intelligence also provided classified technical comments, which we incorporated as appropriate. DHS and the Executive Office of the President did not comment on the draft of our classified report.

Background

The scientific expertise and skills needed for predetonation and postdetonation nuclear forensics can be found across a wide variety of academic disciplines, such as radiochemistry, nuclear engineering and physics, isotope geochemistry, materials

science, and analytical chemistry.² In particular, radiochemistry forms the basis for many of the techniques used to analyze radioactive debris from a nuclear event. Concerns have been raised by academicians and experts from nongovernmental organizations about the limited pool of specialists in these areas at the national laboratories, which would be called upon to perform critical analyses in a nuclear forensics investigation. For example, NTNFC conducted a survey in 2008 that found 247 individuals at eight national laboratories are directly involved in nuclear forensics activities. In addition, the survey showed that these individuals spent an average of 10 percent of their time working on nuclear forensics. Partly because the United States conducted its last nuclear test in 1992, few scientists remain at the national laboratories with hands-on experience in using radiochemistry techniques on debris from a nuclear event and analyzing the results. Those few experienced scientists are rapidly approaching, or have already reached, retirement age. In February 2008, the American Association for the Advancement of Science and the American Physical Society reported that the difficulty in replacing these aging scientists is exacerbated by a precipitous decline in the number of advanced degree programs in radiochemistry at U.S. academic institutions.³

Many of the skills and techniques used in postdetonation nuclear forensics were developed to support the U.S. government's nuclear test program. Scientists at the national laboratories examined radioactive debris and other information from these tests to determine nuclear weapon characteristics, such as the explosive yield (i.e., the amount of energy discharged when a nuclear weapon is detonated). Regarding postdetonation nuclear forensics, DOD and national laboratory officials told us the following activities would occur after an event:

- detecting the event and notifying decision makers;
- evaluating prompt output data, such as gamma, neutron, optical, radio frequency, and electromagnetic pulse emissions;
- collecting air and ground samples;
- conducting analysis and screening procedures at the collection site to try to ensure that the samples sent to the laboratories are of high quality and contain the elements needed to perform nuclear forensics work;
- transporting the samples from the site to the laboratories;
- chemical processing, including dissolution, separations, radiochemical measurements, and data interpretation; and
- reporting results and conclusions to decision makers.

²For purposes of this report, the term “nuclear sciences” is used to refer to these and other disciplines that support nuclear forensics. In addition, the term “radiochemistry” refers to both nuclear chemistry in general and radiochemistry, which is a specific area of study within nuclear chemistry focusing on the chemistry of radioactive materials.

³Joint Working Group of the American Association for the Advancement of Science and the American Physical Society, *Nuclear Forensics: Role, State of the Art, Program Needs* (Washington, D.C., February 2008).

Furthermore, the amount of time needed for these activities depends on many variables, such as the type of event (i.e., whether the explosion is a nuclear device or RDD) and the number and composition of the air and ground samples taken. In addition, the answers to these types of questions may not necessarily emerge sequentially or simultaneously, or at all.

Predetonation nuclear forensics plays an important role in determining the sources of illicitly trafficked nuclear and radiological materials.⁴ According to IAEA, between 1993 and 2007, there were 1,340 confirmed incidents of illicit trafficking and unauthorized activities involving nuclear and radiological materials worldwide. Eighteen of these reported incidents involved nuclear material that could be used to produce a nuclear weapon. Past confirmed incidents of illicit trafficking involved seizures of kilogram quantities of weapons-usable nuclear material, but most cases have involved very small quantities. In some of these cases, it is possible that the seized material was a sample of larger quantities available for illegal purchase. Among these incidents were a number of high-profile seizures of smuggled nuclear material in Europe in the early- and mid-1990s, which led to the further development of predetonation nuclear forensics. These early nuclear forensics efforts were led, in part, by an international group of analytical laboratories known as the International Technical Working Group on Nuclear Smuggling (ITWG). This group began in 1995 as an informal association of nuclear forensics experts working with law enforcement officers, first responders, and regulatory professionals. Since the group's founding, approximately 30 member states and organizations have participated in 13 ITWG annual meetings. In addition, ITWG has sponsored two round-robin exercises testing international predetonation nuclear forensics capabilities. The group also works closely with IAEA to provide IAEA member states with support for nuclear forensics analyses. To that end, ITWG developed a "model action plan" for nuclear forensics, which was subsequently adopted by IAEA in 2006 and serves as that agency's technical guidance on nuclear forensics.

Agencies Face Challenges in Developing the NTNF Program

Rapid nuclear forensics work is essential to ensure that decision makers can promptly receive information that scientists are highly confident is accurate. DOD and DOE national laboratories have begun efforts to significantly reduce the amount of time needed to reach nuclear forensics conclusions in a postdetonation scenario. However, the agencies implementing the NTNF program face significant human capital challenges. Despite this fact, DOE, NTNFC, and national laboratory officials told us that no comprehensive interagency plan exists to guide efforts to address these challenges.

⁴Since 2002, we have issued several reports analyzing U.S. efforts to combat nuclear smuggling in other countries. For example, GAO, *Combating Nuclear Smuggling: Corruption, Maintenance, and Coordination Problems Challenge U.S. Efforts to Provide Radiation Detection Equipment to Other Countries*, GAO-06-311 (Washington, D.C.: Mar. 14, 2006).

Agencies Are Considering Ways to Shorten the Time Needed to Collect, Transport, and Analyze Radioactive Debris Samples after a Nuclear or Radiological Event

In a postdetonation scenario, rapid nuclear forensics work is essential so that decision makers can promptly receive information that scientists are highly confident is accurate. DOD and DOE national laboratories have begun efforts to significantly reduce the amount of time needed to reach nuclear forensics conclusions in a postdetonation scenario. For example, DOD is supporting a number of research and development efforts, such as:

- rapid debris collection, dissolution, and chemical separations techniques;
- innovative radionuclide assay and mass spectrometry approaches to reduce timelines; and
- the development of a new type of debris sampling pod.

Similarly, DOE funds a number of research and development efforts, coordinated with DOD and other agencies, to improve the quality of reported data and shorten the time required to provide nuclear forensics information to decision makers. For example:

- Lawrence Livermore National Laboratory has an initiative to develop new technology for more quickly conducting chemical analysis on samples collected after an event. Using this new technology, scientists would be able to eliminate the process of chemical separation for parts of their sample analysis. In addition, the laboratory has an initiative to modernize and improve the efficiency of equipment used to conduct chemical analyses.
- Pacific Northwest National Laboratory has initiatives to speed up chemical analysis and is gradually acquiring faster analytical instruments to analyze radioactive elements. It also is seeking to automate some of the analysis performed during nuclear forensics investigations. According to laboratory officials, performing chemical analysis of samples from an event generates massive amounts of data that currently require the full-time work of an experienced radiochemist. Automation of some processes could shorten the time required to complete this analysis.

Lack of a Comprehensive Interagency Plan Hinders Efforts to Ensure an Adequate Supply of Trained Personnel for the NTNFC Program

As part of its interagency coordination and stewardship role, NTNFC officials told us their organization is responsible for assuming a leadership role in addressing the human capital challenges facing the NTNFC program. However, DOE, NTNFC, and national laboratory officials told us that no comprehensive interagency plan exists to guide efforts to address these challenges. Nonetheless, NTNFC has taken some steps to analyze the current and future personnel needs for nuclear forensics work at the national laboratories. Specifically:

- In the fall of 2008, NTNFC conducted a survey of manpower requirements for the NTNF program and convened a workshop to discuss human capital issues. The workshop was attended by academicians who collaborate with the NTNF program on personnel issues and DOE laboratory scientists. The survey and workshop discussions found that the availability of Ph.D. radiochemists at the national laboratories is in short supply for both the present and the near future. Furthermore, the workshop participants concluded there is a clear need to recruit in this area. DOE national laboratory officials told us that although graduates of related nuclear sciences have been successfully trained at the national laboratories to do radiochemistry work for nuclear forensics, Ph.D. training in radiochemistry itself provides the most suitable preparation for this work.⁵
- The Nuclear Forensics Science Panel, Education Sub-Panel—a group of active and retired national laboratory scientists and professors who advise the NTNF program on human capital issues—wrote a paper in October 2008 about strengthening the nuclear forensics workforce.⁶ The leader of the group told us this paper was designed to focus attention toward developing a plan to address shortages of Ph.D. radiochemists in the NTNF program.

The Education Sub-Panel estimated that about 35 new nuclear forensics scientists are needed for the NTNF program over the next 10 years, primarily to replace those expected to retire. This includes scientists hired into the general nuclear forensics area and the traditional radiochemistry area. However, neither NTNFC's survey nor the Education Sub-Panel's study fully assessed the short- or long-term supply and demand for these newly graduated Ph.D. scientists, and the leader of the study told us the NTNF program's actual future needs could be significantly different than the panel's estimate. He said there will be a shortage of Ph.D. radiochemists under any set of future circumstances, although the shortage would probably be less acute if analytical equipment at the national laboratories were modernized.

Additional factors could affect the adequacy of the supply of new Ph.D. graduates who are qualified to work as nuclear forensics scientists. For example, the Education Sub-Panel assumed that half of all these new Ph.D. graduates would work as nuclear forensics scientists at the national laboratories, while the other half would work in industry and academia. However, the leader of the study told us this assumption may require additional scrutiny because private companies, such as nuclear energy firms, have become a very attractive and lucrative alternative to working at DOE national laboratories. For example, he noted that at one university, the last nine Ph.D. radiochemistry graduates have gone to work in the nuclear energy industry. However, NTNFC has not determined the effect of demand for Ph.D. radiochemists from the nuclear energy industry or other areas on the human capital challenges facing the NTNF program.

⁵For purposes of this report, scientists with doctoral degrees in other disciplines who have been trained to perform radiochemistry work for nuclear forensics and those with doctoral degrees in radiochemistry may both be referred to as Ph.D. radiochemists.

⁶Nuclear Forensics Science Panel, Education Sub-Panel, *A Plan for Augmenting the Nuclear Forensics Workforce*, Oct. 27, 2008.

On December 18, 2008, after reviewing an early draft of our classified report, NTNFC officials informed us they had begun to develop a framework to guide their efforts. However, they noted these initial steps have not been finalized. NTNFC officials acknowledged there is no interagency plan to address this issue, and the agency has not yet fully assessed the supply and demand needs for key disciplines that support nuclear forensics. NTNFC officials also told us that in fiscal year 2009 they intend to form an interagency committee to formally coordinate activities to address human capital challenges facing the NTNF program.

NTNFC also has led interagency efforts to promote the development of trained radiochemists, including funding summer schools and internships. For example, in fiscal year 2008, NTNFC provided \$150,000 to fund a summer internship program in nuclear forensics for eight students at Lawrence Livermore National Laboratory. However, NTNFC officials told us their efforts to address these challenges have been ad hoc and have not been guided by a comprehensive interagency plan. Furthermore, NTNFC's efforts to promote the development of trained radiochemists have not been well coordinated with some existing efforts at DOE and NRC. For example:

- Through the American Chemical Society, DOE has funded and administered undergraduate summer school programs at two universities to interest students in going on to graduate study in radiochemistry. However, according to the DOE manager for these summer schools, NTNFC has not coordinated its nuclear forensics education efforts with the DOE-funded radiochemistry summer school program.
- NRC has targeted radiochemistry as an area of national need through its Nuclear Education Program, which received \$15 million in fiscal year 2008. Specifically, NRC awarded a 3-year faculty development grant for \$450,000 per year to a radiochemistry professor at Washington State University in 2008. NTNFC officials told us they plan to promote radiochemistry faculty development in the near future. However, NRC officials told us there has been no coordination between the two agencies' efforts.

Agencies Planned to Spend About \$119 Million on Nuclear Forensics Activities in Fiscal Years 2008 and 2009, but Future Costs Are Largely Unknown

According to NTNFC, DOD, DOE, DHS, and FBI planned to spend about \$60 million and \$59 million in fiscal years 2008 and 2009, respectively, to implement the NTNF program. However, this amount underestimates the program's true costs because it does not include costs associated with many DOD, DOE, and State efforts that are critical to support nuclear forensics. NTNFC officials noted that the NTNF Budget Crosscut—an interagency planning document that displays the nuclear forensics budgets of the agencies implementing the NTNF program—only covers the budgets of the agencies and programs responsible for developing and maintaining the operational capabilities needed to conduct nuclear forensics investigations (see table 1). However, the document does not include costs of related efforts that the program relies upon. For example, NTNFC officials noted that the NTNF Budget Crosscut

does not include State spending on nuclear forensics outreach, which NTNFC does not consider to be operational support for the NTNF program. State officials told us the department planned to spend \$450,000 in fiscal year 2008 on nuclear forensics outreach, including promoting the IAEA model action plan for nuclear forensics, conducting international nuclear forensics workshops, and supporting ITWG, which promotes best practices and builds networks among laboratory experts in nuclear forensics.

Table 1: NTNF Budget Crosscut, Fiscal Years 2008-2009

(Dollars in millions)

Agency	Fiscal Year 2008	Fiscal Year 2009
DOD	\$14.8	\$15.5
DOE ^a	22.3	18.4
DHS	15.0	16.9
FBI	7.9	8.2
Total	\$60.0	\$59.0

Source: NTNFC.

^aDOE total does not include spending on nuclear-forensics-related capabilities and readiness of facilities funded by DOE's Nuclear Materials Information Program, Defense Programs, and Defense Nuclear Nonproliferation Program.

Interagency program managers meet biannually to discuss their agencies' planned budgets for nuclear forensics activities. NTNFC officials told us the process used to create the budget crosscut has been helpful in identifying funding gaps, eliminating overlaps, and promoting interagency collaboration. However, while NTNFC has the lead for interagency coordination and planning for nuclear forensics, it has no authority over the budgets for the other agencies' efforts that are part of the NTNF program. As a result, NTNFC officials told us that, if needed, they would have to "cajole and pressure" other agencies to make changes to certain aspects of their nuclear forensics budgets.

The long-term resource needs for the NTNF program are undetermined, in part, because the nation's nuclear forensics capabilities depend heavily on the continued funding of equipment, infrastructure, and personnel currently paid for by other programs, particularly those associated with the maintenance of U.S. nuclear weapons. The agencies implementing the NTNF program have not fully assessed the degree to which the nation's nuclear forensics capabilities depend on the continuation of funding for assets currently supplied by other programs.⁷ As a result, the nation's ability to carry out nuclear forensics investigations may be affected by reductions in the budgets of programs that implementing agencies rely upon to carry out their nuclear forensics missions. In particular, DOD, DOE, DHS, and national laboratory officials told us that the NTNF program relies heavily on the infrastructure, equipment, and personnel at the national laboratories used to support the continued operation of U.S. nuclear weapons. For example, Los Alamos National Laboratory officials told us that most of the operation and maintenance costs for

⁷For purposes of this report, the term "assets" is used to refer to the equipment and infrastructure needed to detect, collect, and analyze radioactive debris samples and other data needed for nuclear forensics investigations.

analytical equipment and other infrastructure are paid for by DOE's Office of Defense Programs—which supports the department's nuclear weapons complex—and not by the NTNF program.

A senior DOE official told us the department faces an enormous challenge in convincing the Congress that reducing funding for the activities of the U.S. nuclear weapons complex directly damages the national laboratories' ability to conduct nuclear forensics investigations. DOE has proposed downsizing its nuclear weapons complex and has proposed reductions to the budgets for related activities, but these efforts may have the unintended consequence of harming the U.S. government's nuclear forensics capabilities. For example, due to fiscal constraints and the expectation of reduced budgets in the future, Lawrence Livermore National Laboratory had a reduction in force in May 2008 of about 500 technical staff, including 9 scientists and technicians who worked on nuclear forensics. While these scientists worked only part time on nuclear forensics issues, their primary responsibilities were to support the nuclear-weapons-related activities of the laboratory, such as maintenance of the U.S. nuclear weapons stockpile. The agencies implementing the NTNF program have not developed a plan to mitigate the effects of planned budgetary reductions for the nuclear weapons complex. As a result, the agencies may face difficulties in ensuring they can effectively carry out their nuclear forensics missions.

Conclusions

The potential consequences of a terrorist attack using a nuclear or radiological device are so severe that the U.S. government must recognize the seriousness of these threats and take appropriate actions to counter or reduce them. Therefore, a comprehensive and responsive nuclear forensics capability is critical to the national security of the United States because it provides a deterrent to other countries that may provide nuclear materials to terrorists and can help attribute a nuclear or radiological event to specific perpetrators. While DHS and other implementing agencies have taken some initial steps to address the human capital challenges facing the NTNF program, these efforts have been limited in scope and, with respect to radiochemistry in particular, not well coordinated with other existing U.S. government efforts. Furthermore, the implementing agencies lack both a comprehensive interagency plan to address this challenge and an understanding of the demand for trained personnel in key disciplines needed to support U.S. nuclear forensics capabilities.

Many of the capabilities used to support the NTNF program depend, in large part, on the continued funding of infrastructure and personnel that have historically been funded by other programs. As a result, the nation's ability to carry out nuclear forensic investigations could be severely affected by reductions or disruptions in support for these efforts. Without a comprehensive assessment of the extent and impact of these leveraged assets on the NTNF program, implementing agencies will face uncertainties in determining their future budgetary needs to support nuclear forensics.

Recommendations for Executive Action

To improve the effectiveness of U.S. government efforts to address challenges facing the NTNF program, we recommend that the Secretary of Homeland Security, working with the Secretaries of Energy, Defense, and State, and the Director of the FBI, take the following three actions:

- Develop a comprehensive interagency plan to address the human capital deficiencies affecting the NTNF program. This plan should include estimates of the long-term demand, from both the U.S. government and private industry, for trained personnel in key disciplines, such as radiochemistry, that support the NTNF program. The plan should be linked with program requirements, address coordination issues with existing federal efforts to promote radiochemistry, and include cost estimates for each aspect of the plan.
- More fully account for the indirect costs borne by DOD, DOE, State, and other agencies that are not currently reflected in the NTNF program budget.
- Assess the potential impact of projected reductions in the budgets for programs that the agencies rely upon to conduct their nuclear forensics missions and take steps to mitigate any negative impacts.

Agency Comments and Our Evaluation

We provided a draft of our classified report to DOD, DOE, DHS, FBI, NRC, the Office of the Director of National Intelligence, State, and the Executive Office of the President. DOD and NRC provided written comments, the unclassified portions of which can be found in enclosures I and II, respectively. The Office of the Director of National Intelligence and State also provided classified written comments, which cannot be included in this report. As discussed in our classified report, DOD and State concurred with our recommendations and NRC and the Office of the Director of National Intelligence did not comment on our recommendations. DOD, DOE, FBI, and the Office of the Director of National Intelligence also provided classified technical comments, which we incorporated as appropriate. DHS and the Executive Office of the President did not comment on the draft of our classified report.

As agreed with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issuance date. At that time, we will send copies of this report to the Secretaries of Defense, Energy, Homeland Security, and State; the Director, FBI; the Administrator, National Nuclear Security Administration; the Chairman, Nuclear Regulatory Commission; the Director, Office of Management and Budget; and other interested parties. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at (202) 512-3841 or aloisee@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Major contributors to this report were Glen Levis (Assistant Director), R. Stockton Butler, and Franklyn Yao. Additional assistance was provided by Dr. Timothy Persons (GAO's Chief Scientist), Rebecca Shea, and Carol Herrnstadt Shulman.

A handwritten signature in black ink that reads "Gene Aloise". The signature is written in a cursive style with a large, looping initial "G".

Gene Aloise
Director, Natural Resources and Environment
Enclosures

List of Congressional Requesters

The Honorable Daniel K. Akaka
Chairman
Subcommittee on Oversight of Government Management,
the Federal Workforce, and the District of Columbia
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Bennie G. Thompson
Chairman
The Honorable Peter T. King
Ranking Member
Committee on Homeland Security
House of Representatives

The Honorable Yvette D. Clarke
Chairwoman
The Honorable Daniel E. Lungren
Ranking Member
Subcommittee on Emerging Threats,
Cybersecurity, and Science and Technology
Committee on Homeland Security
House of Representatives

The Honorable James R. Langevin
The Honorable Michael T. McCaul
House of Representatives

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NUCLEAR AND CHEMICAL
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ASSISTANT TO THE SECRETARY OF DEFENSE
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FEB 19 2009

Mr. Gene Aloise
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Aloise:

This is the Department of Defense's response to the GAO Draft Report, GAO-09-276C, "NUCLEAR FORENSICS: U.S. Efforts Hampered by Equipment, Infrastructure, and Personnel Issues, and a Lack of Baseline Program Requirements," dated January 16, 2009 (GAO Code 360921). The Department concurs with the GAO recommendations. Detailed comments on the report are enclosed.

If you need additional information, please do not hesitate to call me at 703-697-1771. The point of contact for this action is Mr. Arthur Beasley, Defense Threat Reduction Agency, 703-767-4833, arthur.beasley@dtra.mil.

Sincerely,

A handwritten signature in black ink that reads "Fred S. Celec".

Fred S. Celec

Enclosure:
As stated

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Enclosure II: Comments from the Nuclear Regulatory Commission



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001


February 4, 2009

Mr. Gene Aloise
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Aloise:

Thank you for the opportunity to review GAO draft report, GAO-09-276C. The Nuclear Regulatory Commission (NRC) conducted a review of the portion of the draft report that relates to NRC programs associated with the educating and training of sufficient radio-chemists to meet future national needs. The NRC has no comments regarding that portion of the draft report.

Sincerely,


R. W. Borchardt
Executive Director
for Operations

(361063)

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