March 28, 2008

The Honorable Thomas R. Carper
Chairman, Subcommittee on Clean Air
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am providing a summary of actions taken by the agency in response to recommendations contained in various U.S. Government Accountability Office (GAO) reports that address NRC activities. The enclosed summary describes the progress made in addressing recommendations remaining open as of, or not included in, our last summary report of March 12, 2007. In addition, the NRC committed to provide Congress a report on the usefulness of the United States' adopting the Low-Level Radioactive Waste Management Approaches evaluated in the GAO report "Low-Level Radioactive Waste management Approaches Used by Foreign Countries May Provide Useful Lesson for Managing U.S. Radioactive Waste" (GAO-07-221). The NRC's report follows the Summary of our actions on GAO-07-221 at pages A-18-19.

Sincerely,

/RA/

Dale E. Klein

Enclosure: Summary of NRC Actions

cc: Senator George V. Voinovich

Identical letters sent to:

The Honorable Thomas R. Carper
Chairman, Subcommittee on Clean Air
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator George V. Voinovich

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator James M. Inhofe

The Honorable Rick Boucher
Chairman, Subcommittee on Energy
and Air Quality
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Fred Upton

The Honorable John D. Dingell
Chairman, Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Joe Barton

The Honorable Peter J. Visclosky
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
United States House of Representatives
Washington, D.C. 20515
cc: Representative David L. Hobson

The Honorable Byron Dorgan
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510
cc: Senator Pete V. Domenici

The Honorable Joseph I. Lieberman
Chairman, Committee on Homeland Security
and Governmental Affairs
United States Senate
Washington, D.C. 20510
cc: Senator Susan M. Collins

The Honorable Henry A. Waxman
Chairman, Committee on Oversight
and Government Reform
United States House of Representatives
Washington, D.C. 20515
cc: Representative Tom Davis

The Honorable Nick Lampson
Chairman, Subcommittee on Energy
and Environment
Committee on Science and Technology
United States House of Representatives
Washington, D.C. 20515
cc: Representative Bob Inglis

The Honorable Bennie G. Thompson
Chairman, Committee on Homeland Security
United States House of Representatives
Washington, D.C. 20515
cc: Representative Peter T. King

The Honorable Jeff Bingaman
Chairman, Committee on Energy
and Natural Resources
United States Senate
Washington, D.C. 20510
cc: Senator Pete V. Domenici

The Honorable David M. Walker
Comptroller General of the United States
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548
cc: Mr. Gene Aloise

The Honorable Jim Nussle
Director, Office of Management and Budget
725 17th Street, NW
Washington, D.C. 20503

SUMMARY OF NRC ACTIONS

RESPONSE TO GAO REPORTS

Enclosure

GAO Report - Nuclear Security: Federal and State Action Needed to Improve Security of Sealed Radioactive Sources
August 2003
(GAO-03-804)

The U.S. Government Accountability Office (GAO), in its report "Nuclear Security: Federal and State Action Needed to Improve Security of Sealed Radioactive Sources," made specific recommendations to strengthen the NRC's security inspection program. The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation 2

Determine, in consultation with the Agreement States, the costs and benefits of requiring owners of devices that are now generally licensed to apply for specific licenses and whether the costs are commensurate with the risks these devices present.

Status:

Using a risk-informed, graded approach, the NRC and Agreement States have regulated sources and devices in accordance with the Atomic Energy Act of 1954, as amended, by issuing specific licenses, providing provisions in its regulations for general licenses, and providing provisions in its regulations for exemption from licensing (e.g., smoke detectors). The NRC and Agreement States have identified and cataloged the sources of greatest concern; i.e., high-risk sources defined by the International Atomic Energy Agency's (IAEA's) Code of Conduct as Category 1 and Category 2. While some generally licensed devices may include radionuclides defined in the Code of Conduct, the quantities are typically orders of magnitude less than the Category 1 and Category 2 threshold quantities. An inventory of radioactive sources above one tenth of the Category 3 threshold was begun in 2006 and was completed in November 2007.

The NRC initiated a rulemaking in FY 2007 to examine the delineation between general licensing and specific licensing for byproduct materials. As part of the rulemaking, the NRC will determine the appropriateness of the criteria under which the NRC approves devices to be distributed under a general license, including better assurance that larger source quantities will not be approved for generally licensed devices, with particular attention paid to the radionuclides identified in the Code of Conduct. The rulemaking process would include consultation with stakeholders, including Agreement States. A working group has been formed, and the proposed rule is scheduled to go to the Commission in September 2008.

After 9/11 and the issuance of the Code of Conduct, the NRC performed a review of its Sealed Source and Device (SSD) Registry and determined that all IAEA Category 1 sources are already specifically licensed by the NRC and Agreement States. Additionally, with the exception of one type of generally licensed device, all Category 2 source devices are also specifically licensed. The NRC and the Agreement States have identified all devices of this type currently in use under a general license. On a case-by-case basis, the security of these devices is being evaluated and controlled. As the rulemaking discussed above proceeds, the NRC will work with the general licensees and the holders of the SSD certificates.

NRC regulations also require a specific license for all distributors of devices to general licensees. Additionally, NRC regulations under 10 CFR 31.5 require that any person who acquires, receives, possesses, uses, or transfers a generally licensed device must maintain the records of compliance with these requirements; notify the manufacturer and the NRC or Agreement State of any device failure, damage, loss, or theft; not abandon or export the device; and transfer the device only in accordance with specific restriction. The NRC continues to work with the Agreement States to identify sources of concern.

This GAO recommendation remains open.

GAO Report - Information Technology Management:
Governmentwide Strategic Planning, Performance Measurement,
and Investment Management Can Be Further Improved
February 2004
(GAO-04-49)

The U.S. Government Accountability Office (GAO), in its report, "Information Technology Management: Governmentwide Strategic Planning, Performance Measurement, and Investment Management Can Be Further Improved," made several recommendations with respect to improving the NRC's Information Technology (IT) strategic planning and performance measurement processes. The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation 2

To improve the agency's IT investment management processes, the GAO recommended that the Commissioners of the Nuclear Regulatory Commission:

a. include a description of the relationship between the IT investment management process and the department's other organizational plans and processes and its enterprise architecture, and identify external and environmental factors that influence the process in the agency's IT capital planning and investment control policy;

Status:

The NRC's Planning, Budgeting, and Performance Management Process (PBPM) addresses how the IT investment management process and the NRC's other organizational plans and processes are related. Specifically, PBPM integrates the NRC's strategic planning, budgeting, and performance management processes. PBPM links four individual components: (1) setting the NRC's strategic direction, (2) determining activities and performance targets of component offices and related resources, (3) executing the budget, and monitoring performance targets and taking corrective actions, if needed, to achieve those targets, and (4) assessing the NRC's progress toward achieving its goals. IT investments proposed through the PBPM process are then managed through the NRC's Project Management Methodology (PMM), which requires compliance with the NRC's capital planning and investment control (CPIC) and information technology architecture requirements.

The relationship between the IT investment management process and the NRC's other organizational plans and processes and its enterprise architecture is addressed through NRC Management Directive 2.8, "Project Management Methodology," which provides an integrated approach to capital planning and investment control, enterprise architecture, project management, and business process improvement, culminating in a full project life cycle methodology. Management Directive 2.8 was issued by the NRC on July 31, 2007.

The NRC's IT capital planning and investment control policy, formerly in Management Directive 2.2, "Capital Planning and Investment Control," is now contained in Management Directive 2.8.

Supporting processes and documentation for the CPIC policy address the various internal and external factors that influence the IT investment management process. For example, the Vision Statement, a required document for a Tier 1 business case, includes a requirement to address how the investment supports the NRC Strategic Plan, which includes a number of internal and external factors, such as how the investment protects public health and safety and the environment. Also, the IT investment management process itself is influenced by external factors such as new guidance from the Office of Management and Budget and from the National Institute of Standards and Technology. Finally, the IT investment management process is closely linked with the NRC's enterprise architecture. The enterprise architecture is influenced by the Federal Enterprise Architecture, and specific investment decisions are influenced by the various Federal Lines of Business.

The NRC considers this GAO recommendation to be closed.

d. develop a structured IT investment management selection process that includes project selection criteria, a scoring model, and prioritization of proposed investments;

Status:

The NRC's Project Management Methodology provides an integrated approach to capital planning and investment control, enterprise architecture, and project management, and is described in NRC Management Directive 2.8, "Project Management Methodology." The capital planning and investment control component of the PMM includes a structured IT investment management selection process that includes project selection criteria based on a three-tier investment model.

Tier 3 investments are approved by the sponsoring office director and consist of those IT investments that fall below the life cycle cost threshold of $500,000, do not affect the IT infrastructure, and use only the approved tools/technologies as defined in the NRC Technical Reference Model. Tier 2 investments are approved by the CIO and consist of those IT investments that meet or exceed a life cycle cost threshold of $500,000 (but below the Tier 1 threshold) that require some level of management control and oversight to deal effectively with special security, architecture, coordination, staffing, or other concerns with these investments. Tier 1 investments are approved by the Executive Director for Operations and consist of those major IT investments that meet or exceed a life cycle cost threshold of $1,500,000 (or $500,000 for financial management systems) or have other characteristics that are of particular interest to NRC management or to the Office of Management and Budget.

The NRC has also been using ProSight (TM) as its IT investment portfolio management tool since FY 2005. ProSight utilizes criteria and an investment scoring model. The NRC also uses the Decision Lens Suite (TM) to rate and prioritize investments with documented criteria.

The NRC considers this GAO recommendation to be closed.

GAO Report - Nuclear Regulatory Commission: NRC Needs to Do More to Ensure That Power Plants Are Effectively Controlling Spent Nuclear Fuel
April 2005
(GAO-05-339)

The U.S. Government Accountability Office (GAO), in its report "Nuclear Regulatory Commission: NRC Needs to Do More to Ensure That Power Plants Are Effectively Controlling Spent Nuclear Fuel," made two recommendations to improve the effectiveness of nuclear reactor licensees' material control and accounting programs for spent nuclear fuel. The recommendations that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation 1

Establish specific requirements for the control and accounting of loose spent fuel rods and rod segments and nuclear reactor licensees' conduct of their physical inventories.

Status:

As stated in the NRC's comments on the draft GAO report, the NRC believes the regulations related to material control and accounting (MC&A) are clear and do not need revision to address this specific recommendation, although the regulations regarding MC&A are being revised to address other issues. Under 10 CFR 74.19, each licensee is required to keep records of receipt, shipment, disposal, and inventory (including location) of all special nuclear material in its possession and to perform annual physical inventories of all special nuclear material. In this context, all special nuclear material includes irradiated nuclear fuel in all forms and includes rods and pieces. This regulation was the basis for a Severity Level II violation and a civil penalty assessed against the licensee for the Millstone Unit 1 for the missing fuel rods incident.

In response to the issues at Millstone Unit 1, the NRC issued Temporary Instruction (TI) 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants," and conducted detailed inspections of MC&A programs at one decommissioning and 12 operating nuclear power plants. The NRC staff analyzed the results of the inspections conducted in 2005 and issued a report to the Commission in April 2006. Based on the results of the 13 inspections, the staff recommended that inspections of facilities' MC&A programs be conducted at all nuclear power plants and wet storage facilities. In July 2006, the NRC decided to accelerate the inspection program and committed to complete the remaining inspections by FY 2007. During 2007, NRC inspectors completed inspections of MC&A programs at 48 operating power plants, one decommissioning power plant, and two wet storage facilities. In total, NRC completed MC&A inspections at all affected facilities including 65 operating power reactors, four decommissioning power plants (including Millstone Unit 1), and four wet storage sites. Under the existing regulations, violations ranging from Severity Level (SL) II to SL IV were identified at 58 of the 73 sites. The NRC agrees that licensees need more specific guidance in the control and accounting of rods and pieces and the conduct of physical inventory. In January 2007, the NRC sponsored a workshop with industry representatives to inform the industry of the inspection results completed at that time and the path forward for the remaining inspections to be conducted in FY 2007. The workshop included presentations by

industry and the NRC on lessons learned from the TI inspections conducted in 2005 and 2006. The lessons learned included a discussion of findings identified in the inspections.

The NRC staff led an American National Standards Institute (ANSI) committee to revise its standard N15.8, "Nuclear Material Control Systems for Nuclear Power Plants." The scope of the standard is to establish guidelines for the control and accounting of special nuclear material at nuclear power plants. In Spring 2007, the draft standard was finalized and submitted for approval by ANSI. Following the approval of the ANSI standard, the NRC plans to review the standard for endorsement through the revision of Regulatory Guide 5.29, "Nuclear Material Control Systems for Nuclear Power Plants," and Regulatory Guide 5.49, "Internal Transfers of Special Nuclear Material."

This GAO recommendation remains open.

Recommendation 2

Develop and implement appropriate inspection procedures to verify compliance and assess the effectiveness of licensees' material control and accounting programs for spent fuel.

Status:

The NRC is in the process of developing inspection procedures to assess the effectiveness of licensees' MC&A programs, including control and accounting of separated fuel rods and rod pieces. New inspection procedure, 71130.11, "Material Control and Accounting," is undergoing internal review and comment, and this part of the process is expected to be completed by the end of June 2008. The new inspection procedure, which the NRC expects to incorporate into the security reactor oversight program by June 2008, will take into consideration the information from inspectors collected at all sites under TI 2515/154 and other information reported by licensees in response to NRC Bulletin 2005-01.

As stated above, the NRC has conducted 73 detailed inspections under the TI and has analyzed the inspection results. The NRC included lessons learned from all inspections as it developed appropriate inspection procedures to provide ongoing verification of compliance and assessment of the effectiveness of licensees' MC&A programs for spent fuel.

This GAO recommendation remains open.

GAO Report - Nuclear Security: DOE Needs Better Information to Guide Its Expanded Recovery of Sealed Radiological Sources
September 2005
(GAO-05-967)

The U.S. Government Accountability Office (GAO), in its report, "Nuclear Security: DOE Needs Better Information to Guide Its Expanded Recovery of Sealed Radiological Sources," made recommendations for ensuring the control and safe disposal of sealed radiological sources. The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation

The Secretary of Energy and the Chairman of the U.S. Nuclear Regulatory Commission (NRC), in collaboration with the Task Force on Radiation Source Protection and Security, should evaluate and report on:

- The cost implications of a potential expansion of the Department of Energy's (DOE's) recovery and disposal of non-greater-than-Class-C (GTCC) waste from sealed radiological sources;
- Options for DOE to recoup these costs from licensees that may have no commercial waste disposal options;
- The feasibility of disposing of this waste at DOE sites; and
- How a national source tracking system can be designed and implemented to improve DOE's ability to identify and track sealed radiological sources that may need DOE recovery and disposal.

Status:

Section 651 of the Energy Policy Act of 2005 directs the Task Force on Radiation Source Protection and Security to report to Congress and the President on recommendations for, among other matters,

(i) a list of additional radiation sources that should be required to be secured under this Act, based on the potential attractiveness of the sources to terrorists and the extent of the threat to public health and safety of the sources, taking into consideration -
  (I) radiation source radioactivity levels;
  (II) radioactive half-life of a radiation source;
  (III) dispersability;
  (IV) chemical and material form;
  (V) for radioactive materials with a medical use, the availability of the sources to physicians and patients for medical treatment; and

(VI) any other factor that the Chairperson of the Commission determines to be appropriate;

(ii) the establishment of, or modifications to, a national system for recovery of lost or stolen radiation sources;

(iii) the storage of radiation sources that are not used in a safe and secure manner as of the date on which the report is submitted;

(iv) modifications to the national tracking system for radiation sources;

(v) the establishment of, or modifications to, a national system (including user fees and other methods) to provide for the proper disposal of radiation sources secured under this Act;"

On August 15, 2006, the NRC forwarded to the President, Vice President, and various members of Congress the report required by the Energy Policy Act of 2005, documenting the efforts of the interagency Radiation Source Protection and Security Task Force headed by the NRC Chairman. The report includes the Task Force's evaluation of the national system for recovery of lost and stolen sources (Chapter 8), the national system to provide for the proper disposal of radioactive sources (Chapter 9), and the national source tracking system (Chapter 11). The Task Force did not make any recommendations related to the off-site recovery program; however, it recommended that the U.S. Government further evaluate waste disposal options.

The Task Force recommended that a comprehensive analysis be conducted on the inclusion of Category 3 in the National Source Tracking System, but did not recommend inclusion at this time. However, on June 9, 2006, the Commission directed the NRC staff to conduct a one-time survey of licensees to obtain information on sources that contain more than one-tenth of the threshold amount for Category 3 sources and prepare a proposed rule to include Category 3 data in the tracking system. This survey is being conducted as part of the FY 2007 survey of licensees for the interim database. The rulemaking to include one-tenth of the threshold amount for Category 3 sources in the National Source Tracking System is under NRC and Agreement State review.

This GAO recommendation remains open.

GAO Report - Financial Audit: Restatement to the Nuclear Regulatory Commission's Fiscal Year 2003 Financial Statements
October 2005
(GAO-06-30R)

The U.S. Government Accountability Office (GAO), in its report, "Financial Audit: Restatement to the Nuclear Regulatory Commission's Fiscal Year 2003 Financial Statements" (GAO-06-30R), made a recommendation directed toward the Chief Financial Officer (CFO) that GAO anticipates will help the NRC avoid the need for restatements to its future financial statements. The GAO also made a recommendation directed toward the NRC's Inspector General (IG) to work with the NRC's independent auditor so that audit procedures to test for unrecorded and unbilled licensee fees and related internal controls are fully and effectively implemented. The recommendation to the CFO that remained open as of the NRC's last report and summary of progress during 2007 are provided below. The IG will report separately on the status of the GAO's recommendation on audit procedures.

Recommendation

The NRC's CFO should determine whether the new [fee billing] procedures, which the NRC represents as having been established, effectively ensure that all eligible licensee fees are properly recorded and billed.

Status:

In FY 2007, the NRC significantly improved the control environment of fee billing by implementing a number of validation tools that assured accuracy and completeness. In addition, the NRC conducted internal control assessments of the fee billing process and procedures during FY 2007 to ensure that all eligible license fees are properly recorded and billed. No material deficiencies were identified. Recognizing the significant effort made by the NRC, the independent auditors of the NRC's FY 2007 financial statements eliminated this material weakness in their audit report. We plan to continue to monitor closely our controls over the fee billing process.

The NRC considers this GAO recommendation to be closed.

GAO Report - Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation
August 2006
(GAO-06-831)

The U.S. Government Accountability Office (GAO), in its report, "Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation" (GAO-06-831), recommended that several government entities, including the NRC, ensure that their respective enterprise architecture (EA) programs develop and implement plans for fully satisfying each of the conditions in the GAO's Enterprise Architecture Management Maturity Framework (EAMMF). The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Status:

The NRC has taken and continues to take actions to ensure that the NRC's EA program is developing and implementing plans to satisfy the conditions in the GAO's EAMMF. Since the GAO completed its assessment, the NRC has made progress in satisfying the core elements of Stage 2, Building the EA management foundation, and Stage 3, Developing EA products.

With respect to Stage 2 (Building the EA management foundation), the NRC has only partially satisfied three of the nine core elements:

1) The duties of the Enterprise Architecture Review Board are being phased into three working groups (Data Management, Technology, and Change Management), which report to the Information Technology Business Council (ITBC). The ITBC was briefed in December on the purpose of the working groups. The function of the ITBC and the working groups will be to act as the groups representing the enterprise that will be responsible for directing, overseeing, and approving EA.

2) The position of the Chief Enterprise Architect (CEA) exists at the NRC and was filled until January 2007. Presently the duties of the (CEA) are handled by the Director of the Business Process Improvement and Applications Division, who is acting as the CEA until the position is filled.

3) The NRC is in the process of defining an IT/IM Strategic Plan which will include strategies and measures on EA progress, quality, compliance, and return on investment.

With respect to Stage 3 (Developing the EA), last year the NRC satisfied the last remaining core element with the approval and publishing of the Project Management Methodology on June 19, 2007, as the organization policy for EA development.

The NRC's FY 2009 Performance Budget has a measure for achieving the GAO's EAMMF Stage 4 (completing EA projects). Stage 5 (Leveraging the EA for managing change) criteria is projected for FY 2010.

This GAO recommendation remains open.

GAO Report - Nuclear Regulatory Commission: Oversight of Nuclear Power Plant Safety Has Improved but Refinements Are Needed
September 2006
(GAO-06-1029)

In its report, "Nuclear Regulatory Commission: Oversight of Nuclear Power Plant Safety Has Improved, but Refinements Are Needed" (GAO-06-1029), the U.S. Government Accountability Office (GAO) made recommendations for improving the NRC's ability to identify declining safety performance at nuclear power plants before significant safety problems develop. The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation 1

Given its importance to improving the NRC's ability to identify declining safety performance at nuclear power plants before significant safety problems develop, the GAO recommended that the NRC Commissioners:

a. aggressively monitor; evaluate; and, if needed, implement additional methods or processes to increase the effectiveness of its efforts under the reactor oversight process (ROP) to assess safety culture at plants.

Status:

As noted in the GAO's report, the NRC has taken significant actions to incorporate safety culture into the ROP. These efforts have included (1) revising ROP guidance documents and inspection procedures to define key safety culture aspects further and prescribe when an independent assessment of a licensee's safety culture is warranted based on licensee performance; (2) interacting with external stakeholders during the development phase, including the opportunity to provide comments on the draft ROP documents that incorporated the safety culture changes; (3) conducting training for inspectors on the safety culture ROP changes; and (4) implementing a multi-office ROP safety culture focus team to monitor the implementation of the safety culture enhancements, to resolve implementation issues, to interface with internal and external stakeholders, and to evaluate and act on lessons learned.

An 18-month initial implementation period was completed, during which the NRC monitored and evaluated the effectiveness of the enhancements. The need to implement additional methods or processes to increase the effectiveness of the ROP will be determined based on the lessons learned resulting from this initial implementation.

One of the major ROP safety culture enhancements was an extensive modification to inspection procedure IP95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input." Guidance was added to the inspection procedure to describe how the NRC will evaluate a licensee's safety culture assessment, as well as providing guidance on how the NRC will perform its own assessment of the licensee's safety culture. The revised inspection procedure was used for the first time at the Palo Verde site in December 2007. As part of the inspection procedure implementation, a lessons learned report will be generated by the regional office that led the inspection. This

lessons learned report will be considered as part of the overall process to enhance the ROP safety culture guidance.

Early in the implementation of the ROP safety culture enhancements, there were some instances of miscommunications between the inspector and licensee relative to which cross-cutting aspect (elements of safety culture components) of the finding was being discussed. In addition, the ROP inspection database did not readily capture cross-cutting aspects for inspection findings. An inspection guidance change was made so that the cross-cutting aspect could be clearly identified during verbal and written communications. Changes were also made to the ROP inspection database to both retrofit the cross-cutting aspect designators to prior findings (from July 1, 2006) and to capture the cross-cutting aspect designator for future inspection findings.

Other NRC activities were performed that will provide valuable insights to the safety culture lessons learned evaluation. An audit was performed of a sample of 54 inspection reports representing work products from each region across a variety of report types. The audit evaluated the inspection reports with respect to how cross-cutting aspects were documented for inspection findings. The audit group formulated insights with respect to inspection report writing practices and has recommended some changes to the guidance documents. Efforts are underway to enhance inspector guidance to address the audit insights.

Another review group evaluated implementation practices across the four NRC regions with regard to how inspection findings were identified, how cross-cutting aspects were assigned, and how substantive cross-cutting issues were identified. The review group performed peer observations of regional inspection debriefs and mid-cycle assessments. A report from this review will be issued describing recommended changes to the inspection program guidance and to identify regional best practices.

The staff meets periodically with industry representatives at public meetings where feedback is provided from the licensees' perspectives on how the ROP safety culture enhancements were implemented. The industry membership organization, the Nuclear Energy Institute (NEI) has performed surveys to gather insights on the program implementation. The survey results were shared with the NRC for consideration during the lessons learned evaluation process.

The staff has initiated the safety culture lessons learned evaluation process which will result in the development of further enhancements to the ROP in CY2008. These changes will include modifying the safety culture assessment approach in IP95003 and ROP assessment guidance to improve effectiveness and efficiency.

Additionally, on February 25, 2008 the Commission directed the NRC staff, as part of its ongoing assessment of safety culture components of the ROP, to provide the Commission recommendations on how best to update the Commission's policy on safety culture to address the unique aspects of security.

This GAO recommendation remains open.

b. in addition to periodically evaluating the effectiveness of its safety culture efforts, the NRC may also be able, through its performance indicator program, to develop specific indicators to measure important aspects of plants' safety culture. Trends in these

performance indicators could be useful feedback to the NRC on its safety culture activities. The indicators could also provide useful information to the public and other NRC stakeholders on the safety culture at plants.

Status:

The NRC believes that the annual ROP self-assessment process and performance metric report, rather than the ROP performance indicator program, are the better tools to gather and assess feedback on the safety culture enhancements. The NRC will use these feedback processes to provide useful information to internal and external stakeholders and make the ROP more efficient and effective in identifying declining licensee performance. As a first step in the process, the NRC has added a Web page that presents consolidated and comprehensive data on the plants that have substantive, open cross-cutting issues.

The NRC has revised Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," to add a specific measure to determine the effectiveness of this important initiative. In support of this effort, specific questions were added to the internal and external ROP surveys in order to solicit feedback on the safety culture effort. The recent ROP external survey responses are being consolidated and analyzed, and the results will be presented in the annual performance metric report and discussed in the annual ROP self-assessment, which is reviewed by the Commission.

After completion of the staff evaluation of lessons learned of the initial 18-month implementation, the NRC plans to evaluate the need to add additional performance metrics in IMC 0307 in an effort to monitor and trend licensee performance in this area effectively.

This GAO recommendation remains open.

GAO Report - Human Capital: Retirements and Anticipated New Reactor Applications Will Challenge NRC's Workforce
January 2007
(GAO-07-105)

In its report, "Human Capital: Retirements and Anticipated New Reactor Applications Will Challenge NRC's Workforce" (GAO-07-105), the U.S. Government Accountability Office (GAO) made recommendations to improve the NRC's ability to meet its current and future needs for a critically skilled workforce. The recommendations and a summary of progress during 2007 are provided below.

Recommendation 1

Promote the coordination and integration of human capital planning and implementation activities by completing the agency-wide Human Capital implementation plan; ensuring that the Human Capital Council provides strategic direction, advice, and recommendations on addressing human capital issues; and providing the appropriate level of resources to implement the knowledge management program and the strategic training and development plan.

Status:

In FY 2007, the NRC completed its first annual Human Capital Implementation Plan which focused on specific actions taken to align human capital strategies with strategic direction and addressed outstanding human capital challenges requiring our focused attention. In addition, the Human Capital Council (HCC), established in August 2006, provides an agency-level forum for the formulation of strategies to address these human capital challenges, to share best practices, and to develop an integrated approach to address human capital issues. In FY 2007, the HCC provided strategic direction and recommendations on several key issues such as hiring and retention, training and development, human capital funding, and performance management. The agency is committed to fund all knowledge management activities within the offices and has budgeted sufficient funding to provide necessary training to the staff.

The NRC considers this GAO recommendation closed.

Recommendation 2

Systematically assess the effectiveness of NRC's use of tools, authorities, and flexibilities for recruiting, developing, and retaining its workforce and adjust their use and targeting, as necessary, to meet workforce needs.

Status:

The NRC has increased its efforts to assess and adjust its use of tools, authorities, and flexibilities. Some assessment efforts occur as part of the normal human capital planning and reporting cycle, (e.g.; operating plan reports; recurring Annual Employee surveys and Safety Culture surveys; and the use of Office of Personnel Management tools such as the Performance Appraisal Assessment Tool, Senior Executive Service certification reviews, and, the Human Capital Assessment and Accountability Framework). Other assessment tools being used

include Senior Performance Official assessments, exit interview surveys, and nonrecurring workforce surveys. The Office of Human Resources, in coordination with the senior leadership team and a panel of NRC senior managers who make recommendations on the use of several hiring and retention flexibilities, have focused attention on reviewing NRC's use of flexibilities and improving guidance on the use of certain authorities. NRC also periodically reviews its need for and the design of specific flexibilities such as group recruitment, and relocation or retention incentives.

The NRC considers this GAO recommendation closed.

Recommendation 3

Periodically and comprehensively evaluate and share information among NRC's offices on the usefulness of human capital measures, intended outputs, and targets to enhance NRC's ability to monitor trends, reliably measure progress, and inform program office managers in achieving critical human capital tasks.

Status:

In strategically managing human capital, the key accountability tool is the agency Operating Plan, which measures outcomes against performance goals and objectives for major program areas. Certain measures have been integrated with the Senior Performance Official's assessment process, which provides excellent feedback that reflects customer perspectives and offers areas for improvement. Some key human capital Operating Plan measures have also been incorporated into executive performance plans. The Operating Plan measures are now being shared throughout the agency in real time through the use of a web based tool (Sharepoint) that allows all offices to view the data. The agency implemented several recommendations following a Lean Six Sigma review of our staffing process to streamline the hiring process and make more efficient use of tools and flexibilities.

The NRC considers this GAO recommendation closed.

Recommendation 4

Survey employees during FY 2007 on their satisfaction with NRC's Human Capital program, including new initiatives and offices' use of flexibilities to maintain a quality work environment.

Status:

NRC contracted with the Office of Personnel Management to administer our 2007 NRC Annual Employee Survey. The total number of surveys completed was 2531 for a population of 3575; therefore, our final response rate was 71%. This is an improvement from our last year response rate of 57% and well above the Government average which was also 57%. The survey is closed at this point and is in the data analysis stage.

The NRC considers this GAO recommendation closed.

GAO Report - Low-level Radioactive Waste Management: Approaches Used by Foreign Countries Would Provide Useful Lessons for Managing U.S. Radioactive Waste
March 2007
(GAO-07-221)

In its report, "Low-Level Radioactive Waste Management: Approaches Used by Foreign Countries May Provide Useful Lessons for Managing U.S. Radioactive Waste" (GAO-07-221), the U.S. Government Accountability Office (GAO) made recommendations directed towards improving the management of low-level radioactive waste (LLRW) in the U.S. and address a potential shortfall of disposal availability for higher-activity LLRW in 2008, and other management concerns. The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation

The GAO recommended that the Chairman of NRC and the Secretary of Energy evaluate and report back to the Congress within 1 year on the usefulness to the U.S. of:

a. adopting the LLRW management approaches used in the countries discussed in GAO-07-221, and the steps and any authorities necessary for their implementation, if deemed appropriate, and

b. developing a U.S. radioactive waste management plan, and the potential costs, steps, and any authorities necessary to develop such a plan, if deemed appropriate.

Status:

In a February 21, 2007 letter to Mr. Gene Aloise of GAO, the NRC provided comments on a draft of the foreign LLRW approaches report, including the view that a stand-alone study, as recommended by GAO, may not be the most effective means to evaluate the usefulness of adopting many of the LLRW management approaches discussed in the report. NRC also stated that it would report on the usefulness of foreign approaches in NRC's annual letter to Congress that addresses progress in completing actions in response to multiple GAO reports. GAO, in analyzing NRC's comments in its final report, stated that "we do not take issue with how NRC and DOE may choose to report to the Congress, as long as Congress gets the information it needs, the reporting format is a secondary consideration." In the attachment to this letter, the NRC staff has described and evaluated each of the foreign approaches in the GAO report in detail and their usefulness to the U.S. program. In developing the attached report, the NRC staff coordinated with the Department of Energy (DOE). The NRC requested DOE review and comment on portions of the report that address DOE responsibilities related to commercial LLRW, such as its Offsite Source Recovery Project. NRC staff incorporated DOE's suggestions on these areas into the report.

NRC agrees that international approaches to LLRW management should continue to be evaluated for their potential use in the U.S. Both DOE and NRC are actively engaged in learning about waste management practices used in other countries, as well as sharing best practices from the U.S. All exchanges occur through a number of formal and informal interactions and activities, such as through participation in the Joint Convention on the Safety of

Spent Fuel Management and on the Safety of Radioactive Waste Management; involvement in International Atomic Energy Agency (IAEA) meetings, expert missions, and safety standards and guide development, and by participation on the Nuclear Energy Agency Radioactive Waste Management Committee. NRC also participates in bilateral and trilateral exchanges with numerous other countries (e.g., Korea, Lithuania, Romania, Iraq, and France) in numerous areas, including disposal of radioactive waste. Although the U.S. has been successful in safely disposing of its LLRW, NRC is aware of the challenges that remain, such as the expected closure this year of the Barnwell, South Carolina LLRW disposal facility to most of the U.S.'s LLRW generators. NRC's actions in response to this and other LLRW challenges will be informed by international practices. In addition, NRC recently completed a strategic assessment of its LLRW program to identify actions it could take that would contribute most to the NRC's goals of safety and security. A number of international approaches were evaluated and prioritized. NRC will consider these international approaches in implementing the specific tasks identified in the strategic assessment that are designed to improve the LLRW regulatory program. Although the NRC strategic assessment did not include major new actions to align the U.S. program with some foreign programs, such as the development of a National Waste Management plan and a National radioactive waste data base, a number of high priority tasks that the staff is implementing will benefit from insights gained from foreign LLRW programs. These include, for example, revised guidance for disposal of low-activity waste and waste classification.

The NRC's comprehensive analysis of foreign approaches for their usefulness to the U.S. follow this summary. Additionally, the NRC staff is available to brief Congress on the LLWR program, if requested.

NRC considers this GAO recommendation to be closed.

NRC Evaluation of Foreign Approaches for Management of Low-Level Radioactive Waste (LLRW)

Introduction

In March 2007, the Government Accountability Office published, "Low-Level Radioactive Waste Management: Approaches Used by Foreign Countries May Provide Useful Lessons for Managing U.S. Radioactive Waste (GAO-07-221)." In this report, GAO evaluated techniques that other countries use to manage low-level radioactive waste (LLRW),[1] with the goal of providing insights on how previously identified limitations in the U.S. LLRW program might be overcome. Although the U.S. LLRW program for non-U.S. Department of Energy (DOE) generators[2] (hereafter, commercial generators) has been successful over the last several decades in safely disposing of the majority of LLRW that has been generated, particularly in comparison with many foreign countries, GAO and others have identified certain limitations in the U.S. program. GAO was therefore asked to examine four specific techniques that other countries use in managing and disposing of their waste. In conducting its study, GAO also determined that a fifth approach, the development of a national waste management plan, may have merit in the U.S. and included an analysis of it in their final report.

The specific approaches that GAO evaluated were the following:

- National radioactive waste inventory databases. Foreign countries use these databases to forecast waste volumes, plan for storage and disposal capacity, and track the location of disused sealed radiological sources.
- Timely removal of higher-activity LLRW, essentially sealed radiological sources, from generator sites to enhance safety and security.
- Alternative disposal options (such as municipal landfills) for lower-activity LLRW, central storage options for higher-activity LLRW, and alternative disposal options for very LLRW that in most cases does not require an exemption review by the nuclear regulatory authority.
- Financial assurance requirements for all waste generators to cover ultimate disposition costs.
- National waste management plans that outline, at the national level, an overall strategy and associated activities for managing a country's LLRW.

In its report, GAO recommended that NRC and DOE evaluate and report to Congress on the usefulness of adopting the LLRW management approaches evaluated in its report, and the steps and authorities necessary to implement them. Consistent with NRC's comments on a draft of the GAO report, and with GAO's agreement in its final report, NRC is providing this evaluation for Congress in its annual letter addressing all GAO report recommendations affecting NRC.[3]

---

[1] LLRW is a byproduct of the generation of electricity by nuclear power plants and the use radioactive materials in diagnosing and treating disease, performing research, and producing goods.

[2] Strictly speaking, some of the LLRW generators in the national program are government organizations, such as the National Institutes of Health. In practice, most are companies and the term "commercial generators" is commonly used. The U.S. Department of Energy also produces LLRW, but its LLRW program was not evaluated in this GAO report.

[3] In our February 21, 2007 letter commenting on a draft of the GAO report, NRC stated that a stand-alone study, as recommended by GAO, may not be the most effective means to evaluate the usefulness of adopting many of the LLRW management approaches discussed in the GAO report. NRC also stated that it would report on the usefulness

In the following sections, the staff describes and analyzes the usefulness of each of the foreign approaches identified by GAO to the U.S. LLRW program, and where applicable, the steps and authorities necessary to implement the approaches. In order to provide context for this evaluation, the staff first provides a summary of the U.S. LLRW program as it exists today and its limitations as identified by GAO in earlier reports.

In developing this response, the NRC staff has coordinated with DOE staff in the Office of Environmental Management and the National Nuclear Security Administration. The staff requested DOE review and comment on portions of this report that address DOE responsibilities related to commercial LLRW, such as its Offsite Source Recovery Project. NRC staff incorporated DOE's suggestions on these areas into the report.

Conclusions and Recommendations

1. Two of the 5 foreign approaches (national waste management plans and national LLRW inventories) identified by GAO would be of limited use in the U.S. because the U.S. national strategy for its LLRW program for managing and permanently disposing of LLRW is fundamentally different from a number of foreign countries. Many foreign countries assign responsibilities for both regulatory oversight and development of facilities to agencies in the central governments. In fulfilling this responsibility, these countries have often developed national waste management plans based on what they have determined to be their national LLRW inventories. The plans are used to implement the central government's responsibility and identify needed actions. The national inventories are used to identify the capacity needed for national storage and disposal facilities. The approach used in the U.S. is fundamentally different from other nations in that the responsibility for LLRW disposal is placed with the States under the Low-Level Radioactive Waste Policy Amendments Act of 1985. In addition, private companies provide commercial waste management and disposal services to generators of LLRW in areas where the States are not involved. The Federal government's role in the LLRW program in developing and implementing options for managing and/or disposing of LLRW is thus limited. DOE implements a program to recover and centrally store certain disused or other types of sealed radiological sources from the commercial sector to address certain public health and safety and national security concerns. Additionally, DOE is responsible for developing disposal capacity for LLRW that exceeds class C criteria (known as greater-than-class C (GTCC) LLRW), which is a small fraction of the LLRW generated in the U.S. NRC and the Agreement States regulate the health, safety, and security aspects of commercial, medical and academic uses of radioactive materials, including generation, management and disposal of LLRW resulting from such activities.

   In addition to their incompatibility with the U.S. national strategy for managing and disposing of LLRW, both a national LLRW management plan and database would require significant resolution to develop and implement. Because of their limited

---

of foreign approaches in NRC's annual letter to Congress that addresses progress in completing actions in response to multiple GAO reports. GAO, in analyzing NRC's comments in its final report, stated that "we do not take issue with how NRC and DOE may choose to report to the Congress, as long as Congress gets the information it needs, the reporting format is a secondary consideration."

usefulness and high costs, NRC does not believe that either should be pursued at this time.

2. Other approaches used by foreign countries are either used in the U.S. already or are currently being formally evaluated.

   - According to GAO, most countries use centralized interim or long-term storage for some LLRW, in large part because many countries do not have a permanent disposal option. In the U.S., many types of LLRW have a permanent disposal option, and storage is not necessary. All Class A waste, which accounts for the largest volume of any of the waste classes, may currently be disposed of. However, some LLRW is currently being centrally stored. Many sealed sources, which may ultimately become LLRW, are stored centrally by DOE in its Offsite Source Recovery Project, and private companies, in responding to a market need, are considering development of central storage facilities.

   - GAO found that many countries use clearance or unrestricted removal of very low-level waste from regulatory control as LLRW, and some provide for alternative disposal options (such as municipal landfills) for this waste. The U.S. also uses these alternative approaches. Clearance of materials occurs using regulatory guidance and/or through case-by-case approvals. Alternative disposal, typically in Resource Conservation and Recovery Act (RCRA) hazardous waste facilities, also occurs fairly routinely. The U.S. has considered developing regulations for both of these approaches, which might align them better with international practices, but these rulemakings are on hold because of higher priority work. For the clearance rulemaking, the Commission stated that it's decision was based on the fact that NRC was faced with several high priority and complex tasks, that the current approach to review specific cases on an individual basis is fully protective of public health and safety, and that the immediate need for this rule had changed due to the shift in timing for reactor decommissioning.

   - GAO also found that many countries require all non-utility LLRW generators to have sufficient financial assurance to cover the removal of radioactive waste from their sites. NRC currently has financial assurance requirements for certain non-utility LLRW generators and is currently undertaking an effort to evaluate financial assurance requirements for all licensees possessing IAEA Category 1, 2, and 3 sources.[4] The FY 2009 budget includes resources for this activity. A working group with States and other stakeholders is to be formed by October 1, 2008, and is to make a recommendation on whether to pursue a rulemaking a year later.

3. Based on the analysis in this report, the NRC considers this GAO recommendation to be closed. NRC will continue to evaluate international approaches to LLRW management and disposal in its ongoing programs. NRC will also continue to pursue those planned

[4] Sources are classified in accordance with the IAEA Code of Conduct on the Safety and Security of Radioactive Sources. The code establishes 5 categories of increasing concern, and correspondingly increasing controls to ensure security.

activities that will address some of the GAO findings, as noted above and later in this report. NRC is available to brief Congress on LLRW management if requested.

Status of U.S. LLRW Program

In this section, NRC staff summarizes the status of the national LLRW program in the U.S., in order to provide context for the limitations that GAO has previously identified.

- Disposal--for most LLRW generated in the U.S. by commercial licensees, disposal options currently are available, but this will change in the near future if the Barnwell disposal facility in South Carolina closes to out-of-compact LLRW generators as expected in June 2008. At that time, the majority of U.S. generators will no longer have a disposal option for their class B and C LLRW and will have to store it until a new disposal option becomes available. Licensees have disposal options for very low-level waste or low-activity waste, a subset of LLRW that poses a relatively small hazard and can therefore be disposed of in alternative types of disposal facilities, has disposal options for the foreseeable future. Related to this category of low-activity waste are materials that are cleared from regulatory control. They may be wastes that are sent to a municipal landfill, or, less often, they may be useable materials with trace amounts of radioactivity that are recycled. NRC and Agreement States have guidance for clearing materials. The highest hazard of LLRW, GTCC, has no disposal option at this time, but DOE has initiated activities to develop disposal options.

  Currently, there are three operating disposal sites licensed to accept LLRW. The U.S. Ecology facility in Richland Washington accepts class A, B, and C LLRW from 11 western States in the Northwest and Rocky Mountain Compacts. This facility is expected to remain open for approximately 50 more years. The EnergySolutions facility in Barnwell, SC, is currently accepting class A, B, and C waste from LLRW generators across the U.S., but on June 30, 2008, Barnwell will close to all but generators in the Atlantic LLRW Compact (the States of South Carolina, Connecticut and New Jersey), leaving 36 States with no disposal option for class B and C waste. The Barnwell facility has capacity for its generators for several more decades. The EnergySolutions facility in Clive, Utah, accepts class A waste from most of the U.S. (generators in the Rocky Mountain and Northwest Compacts already have disposal options at the Richland facility) and has the capacity to remain open for several more decades. A private company has proposed a new facility in Texas for the Texas Compact (the States of Texas and Vermont) LLRW generators. The facility would accept class A, B, and C waste. In addition to generators in the Texas Compact, the facility will also accept DOE waste. With the approval of the Texas Compact Commission, it could also accept waste from out-of-compact generators. Texas is scheduled to make a decision on that application in approximately one year. For the most hazardous class of LLRW (greater-than-class C), DOE, under the Low-Level Radioactive Waste Policy Amendments Act of 1985, is responsible for developing disposal capacity. DOE has initiated an Environmental Impact Statement process, publishing a Notice of Intent for the EIS on July 23, 2007. In that notice, DOE described generally the options it plans to consider in the EIS. DOE expects to issue a final EIS in approximately two years. After it does so, Congress must approve DOE's decision on how to proceed. Thus, disposal of GTCC waste is still a number of years away.

- Storage--as noted above, most U.S. generators will be forced to store their class B and C LLRW beginning June 30, 2008, and currently store their GTCC waste. Aside from sealed sources, discussed below, there is little centralized storage of LLRW for commercial licensees at this time, so class B/C generators will have to store their waste onsite. NRC and Agreement States will be focusing on the non-utility generators of class B/C waste that will have to begin storage later this year. Nuclear power plants licensees are well equipped to store these types of materials. For non-utility generators, NRC is updating its LLRW storage guidance that applies to them, and NRC and Agreement States will oversee and inspect storage in such facilities in their regulatory programs.

  The number of non-utility generators of class B/C LLRW that is not contained in sealed sources or devices is relatively small. Of the approximately 22,000 materials licensees in the U.S., only about 10% generate LLRW that must be disposed of in a licensed LLRW disposal facility, based on data from several States that require reporting of LLRW, and DOE's disposal database. A small number of these, based on available data, generate class B/C waste. Most use radioactive materials that decay-in-storage and are subsequently disposed of as ordinary trash. Many others possess radioactive materials in sealed sources, which may or may not become LLRW[5] and many of which are already being centrally stored, in part because of the unique security concerns associated with their potential use in a radiological dispersal device. DOE has an Offsite Source Recovery Project that recovers unwanted, orphaned, and abandoned sealed sources that lack a disposal path and stores them at the Los Alamos National Laboratory. Most sealed sources addressed in this manner constitute GTCC waste. More than 16,000 sources have been collected to date. Disused sealed sources may become LLRW when the user declares them as such, or source manufacturers may recycle them. Because it is not always clear whether a disused source is LLRW or not, this category of potential LLRW is often addressed separately from LLRW. GAO's report highlights several issues that are unique to sealed sources and several of the approaches it evaluated have particular applicability to sealed sources. This report also addresses the unique aspects of sealed sources.

GAO's Previously Identified Limitations

GAO has previously identified limitations in the U.S. program for managing and disposing of LLW produced by commercial generators in the U.S. The purpose of its report on international approaches was to identify potential approaches to overcome these limitations. The following is a summary and description of the limitations in the U.S. LLRW program previously identified by GAO.

- With respect to a database for LLRW commercial disposal that is maintained by DOE, called the Manifest Information Management System (MIMS), it found that there were

[5] As noted earlier, sources are classified in accordance with the IAEA Code of Conduct on the Safety and Security of Radioactive Sources. The code establishes 5 categories of increasing concern, and correspondingly increasing controls to ensure security. There is no direct relationship between the Code of Conduct categories and the LLRW classes in the U.S. LLRW is classified as Class A, B, C, or GTCC, which is based on concentration of radioactivity, not the amount, which defines the IAEA categories. A further complicating factor is that when sources are disposed, they may be placed in containers and the volume of the radioactivity averaged over the volume of the container, not just the volume of the source.

some missing data and data inaccuracies. DOE has since corrected these. GAO also found that the scope of the database did not include information on LLRW that is stored at waste generator sites.

- GAO found that there was uncertain disposal availability for B/C waste in the future, but that there was no Federal oversight of disposal availability or conditions of stored waste. GAO recommended that Congress consider directing NRC as the Federal agency to report to it if LLRW disposal and storage conditions should change enough to warrant consideration of new legislation. NRC did not agree with that recommendation and Congress has not so directed NRC since that time.

- GAO found that the planned National Source Tracking System (NSTS), which is being developed in part to implement the IAEA Code of Conduct on the Safety and Security of Sealed Sources, did not include many of the sources that DOE had recovered from commercial licensees. The NSTS, as envisioned in 2005 when GAO evaluated it, included only Category 1 and 2 sources, but not Category 3, which comprised many of those that DOE had recovered. The report also found that DOE lacked a financial mechanism to recover the costs of retrieving, storing and eventually disposing of sources it collects from commercial licensees.

- GAO found that NRC did not require all non-utility waste generators, particularly those with sealed sources, to ensure that funds are available to cover future disposition costs.

Evaluation of Foreign Approaches

NRC staff has evaluated each of the five foreign approaches for management of LLRW that GAO proposes could help to overcome the previously identified limitations. In the following sections, the staff describes the approach and how the U.S. program is addressing the same problem that approach is meant to solve. In a number of cases, the staff describes ongoing work in the U.S. program. The staff evaluation begins with an analysis of national waste management plans, since several of the other approaches implement national plans. As a result, the applicability of these more detailed approaches depends in part upon the use of a national plan in the U.S.

National LLRW Management Plans

Description:

GAO found that national waste management plans are used to guide the management of radioactive waste from a national perspective. Foreign countries frequently use national entities to manage and dispose of their radioactive waste. In France, for example, ANDRA, the French National Agency for Radioactive Waste Management, a "public industrial and commercial organization," is responsible for the long-term management of radioactive waste produced in that country. It comes under the supervision of the French Ministries for Industry, Research, and the Environment. In Spain, ENRESA, "a public business entity," plays a similar role, and reports to the Ministry of Industry, Tourism, and Trade.

Generally, the plans identify strategies for management of wastes, provide an inventory of waste, forecast future waste production, and identify specific actions to be taken to implement

the national strategy. They may also address costs of development of facilities and the fees to be charged to generators. These plans may include not just LLRW, but in France, Germany and Spain, for example, include all radioactive waste types, including uranium mill tailings, high-level waste, and even wastes containing naturally occurring radionuclides.

GAO noted that the U.S. does not have such a plan, and that there is no single Federal agency or other organization responsible for coordinating LLRW stakeholder groups to develop such a plan. As envisioned by GAO, such a plan could integrate the various radioactive waste management programs that reside at the Federal and State levels into a single source document. In GAO's view, a national plan could also assist those interested in radioactive waste management to identify waste quantities and locations, plan for future storage and disposal development, uncover research and development opportunities, and assess the need for regulatory or legislative actions. For example, GAO noted that there is no national contingency plan, other than allowing LLRW storage at waste generator sites, to address the impending closure of the Barnwell LLRW disposal facility. The availability of a national plan and periodic reporting on waste conditions might, in GAO's view, also provide the Congress and the public a more accessible means to monitor the management of radioactive waste and provide a mechanism to build greater public trust in the management of these wastes in the United States.

Evaluation:

For a variety of reasons, NRC (and DOE in its letter commenting on the draft GAO report) has significant reservations about the preparation of a national radioactive waste management plan. First, a national waste management plan is designed to implement a national strategy of central government responsibility and authority to manage and dispose of LLRW. The U.S. does not have such a strategy, and thus the development of a national LLRW management plan is much less useful in this country. The U.S. has developed high-level strategies for managing and disposing of LLRW and other types of radioactive waste in the existing Federal laws. The Low-Level Radioactive Waste Policy Amendments Act of 1985, e.g., contains the national strategy for LLRW that States are responsible to provide for disposal capacity of this waste, and may form regional compacts with the legal authority to exclude out-of-compact waste. At the broadest level, the LLRWPAA is a plan–it assigns responsibilities, lays out programs and milestones, and identifies specific activities to be undertaken by various entities. For a variety of reasons, most of the States activities under the LLRWPAA have ceased–generation rates are low, and a private company has taken over disposal of most of the lower activity waste, outside of the LLRWPAA framework. Where States and Compacts do not regulate or provide for LLRW management, private companies, operating in a free market and responding to the needs of LLRW generators, manage and dispose of these wastes. The U.S. has a large waste processing industry with several dozen companies that serve the LLW generators in the U.S. Private companies are also providing for some disposal of LLRW, outside of the LLRWPAA, including several that accept large quantities of low-activity waste. Finally, individual generators manage their waste, by storage, in the absence of disposal options in this country and are regulated by NRC and the Agreement States to ensure that such storage is done safely and securely.

Second, GAO did not identify the national problem that it believes could be solved by the implementation of such a plan. There was no direct connection identified between the limitations in the U.S. program and a national low-level waste management plan. While there are 'limitations' in the U.S. program, as identified earlier in this report, the U.S. has been largely

successful, especially relative to many foreign countries, in safely disposing of the LLRW and other types of radioactive waste that it produces over the last several decades.

Third, with respect to the development of a national waste management plan that addresses all types of radioactive waste, and not just LLRW (which is discussed above), the same arguments apply. The U.S. has strategies already contained in existing legislation for other types of radioactive waste. Uranium mill tailings are addressed in the Uranium Mill Tailings Radiation Control Act, high-level waste disposal in the Nuclear Waste Policy Act, other radioactive wastes are addressed in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, and radioactive wastes with naturally occurring materials are largely addressed in State laws. Organizations implementing these laws have developed detailed plans consistent with their authorizing legislation. The amount of waste and facilities generating these other types of waste are significantly larger than those for just LLRW. For example, each year, the amount of TENORM produced is 10,000 times that of LLRW disposed of.

Fourth, most of the foreign countries have small nuclear programs where a single national plan is practical to prepare and implement. The U.S., on the other hand, has a large and complex nuclear program, including the radioactive waste management aspects of that program. It has 104 of the 435 nuclear power reactors in the world, while the other 30 countries share 331. Some of the countries surveyed by GAO do not have nuclear power plants at all. The U.S. has more than 22,000 licensees under the Atomic Energy Act of 1954, as amended (AEA), while Spain, e.g., which has one of the larger disposal programs evaluated by GAO, has just 1300. U.S. licensees are regulated by dozens of regulatory agencies, most of which are State and not Federal. States license all commercial U.S. LLRW disposal facilities.

NRC also supports DOE views on the national waste management plans. In commenting on the draft GAO report, DOE made a number of points in addition to those identified above. They noted that, given the complexity of the U.S. programs, a single document synthesizing the many efforts to manage LLRW would facilitate understanding of these complex programs, but that developing a national waste management plan would provide limited utility to the actual implementation of these strategies. It would also require diversion of significant resources from actual waste management efforts. DOE noted that the U.S. Second National Report to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, developed in 2005, provides a summary of the existing national waste management strategies, issues, and progress. As such, it provides the transparency benefits that the national waste management plans used in other countries provide.

NRC also noted it is not clear that any Federal agency is authorized under existing legislation to develop a plan as envisioned by GAO. NRC's responsibilities under the AEA are limited to safety and security and do not include broader activities, such as planning, screening, selecting, and developing new sites; assessing fees for management of waste disposal, and forecasting future waste generation and disposal needs that go along with the broader responsibilities associated with managing and disposing of waste. DOE's only statutory responsibility for commercial waste is the development of disposal capacity for greater than class C waste.

Conclusion:

The staff has concluded that, because the U.S. strategy for management and disposal of waste relies largely on States and the private sector, a national waste management plan prepared by the Federal government has limited utility and should not be pursued, unless Congress were to change the national strategy. Such plans are particularly valuable when countries establish, as a matter of policy, that their central governments are responsible for managing and disposing of LLRW. If Congress were to revise the existing LLRW legislation and designate the Federal government as responsible for management and disposal of commercial waste, such a plan would be of much greater value. With respect to the broader scope of a national plan including all types of radioactive waste, such as high-level waste and mill tailings, the same comments apply.

NRC acknowledges that challenges remain in the U.S. LLRW program, but believes that there is no immediate crises in the safe disposal of LLRW. Most LLRW can still be disposed of, and if later this year the Barnwell LLRW disposal facility closes to most U.S. generators, which have no disposal option, the LLRW is expected to be safely stored. In the long term, a new disposal facility for Class A, B and C LLRW is undergoing a licensing review in the State of Texas. Although, it is designed to accept commercial waste from generators in the State of Texas and Vermont only, the Texas LLRW Compact has the authority to allow access from out-of-compact generators. In the meantime, NRC and other entities are addressing specific LLRW challenges as described later in this report to avert a crisis in the future.

National database of LLRW

Description:

As with national waste management plans, GAO found that most countries use national databases. These databases typically contain the amount and location of waste, the waste generators, the type of waste (particularly whether a sealed source is involved), and include all types of LLRW generators-academic, government, industrial, medical and nuclear reactors. GAO reported that foreign countries use their national radioactive waste inventory to forecast waste volumes, plan for disposal capacity, and track the location of sealed radiological sources. Conventional LLRW and sealed sources are typically included in foreign databases, but some countries also include very low-level waste as well. According to GAO, more than half of the countries surveyed indicated that they publicized information from their national waste databases on what is stored and disposed of to gain community acceptance for siting facilities.

With respect to sealed sources in particular, most countries have developed registries that included Category 1, 2 and 3 sources, and somewhat less than half included all sources (category 4 and 5). The *IAEA Code of Conduct on the Safety and Security of Radioactive Sources* recommends that Categories 1 and 2, as a minimum, be included in national registries. Tracking of these higher activity sources contributes to national security. In September 2005, GAO found that, as proposed at that time, the NSTS would be of little use to DOE in its efforts for the recovery and disposal of unwanted sealed radiological sources, largely because the NSTS proposed at that time did not plan to track beyond Category 2 sources. GAO believed that these lower activity sources posed enough of a safety and security risk to warrant their recovery by DOE, but these sources were not included in the NSTS as envisioned at that time.

Evaluation:

Much of the information that GAO found useful in foreign country databases is already being collected, or is planned to be collected, in the near future. DOE manages a web based Manifest Information Management System (MIMS), which contains data on LLRW disposed of at the commercial LLRW disposal sites in the U.S. Disposal data go back as far as 1985 and a wide variety of reports can be generated, including by State, Compact, radionuclide, generator category, date range, and disposal site.

With respect to sealed sources databases, the U.S. is currently developing a National Source Tracking System (NSTS) to track individual radiological sources for Category 1 and 2 sources. The NSTS will be a web-based system that will contain cradle-to-grave information on high-risk sealed sources. On November 8, 2006, NRC issued a rule to require licensees to report information on the manufacture, transfer, receipt, disassembly, and disposal of all Category 1 and 2 sources throughout their entire life cycle in the National Source Tracking System (NSTS). The latest estimate is that the NSTS will be operational in May 2008. The NSTS proposed at the time of the GAO report was to contain only Category 1 and 2 sources. Since then, NRC has decided to add Category 3 sources after the initial system is developed for the higher activity sources. NRC has also initiated a rulemaking to expand the NSTS to include Category 3 data and to complete it within 3 years (i.e., NRC staff would provide the Commission a final rulemaking package in 2009). The effective date for NSTS expansion to Category 3 is expected in June 2009. The NSTS and its scope are discussed in more detail in the section below on timely removal of LLRW from generator sites.

The U.S. does not have a national database that includes LLRW in storage, however, which, in GAO's view, would be helpful in planning for centralized storage and permanent disposal. All generators in the U.S. have a disposal option for class A LLRW. Thus, an inventory of class B/C waste in storage would be of most potential use in this country. The number of non-utility generators of class B/C waste in the U.S. is small, thus making the benefits of a national database less useful. Using data from the DOE MIMS for disposal, and from three States[6] that collect data on LLRW in storage, NRC staff estimates that the number of LLRW generators in the U.S. is approximately 10% of the 22,000 licensees, or around 2000, and the number of B/C generators is a small fraction of those. The majority of materials licensees either decay their radioactive waste in storage, and then dispose of it as ordinary trash, or have sealed sources, which may or may not require disposal and which will be tracked in the NSTS in any case.

The NRC staff believes that LLRW databases, as envisioned by GAO, are particularly useful for those countries that have assigned waste management responsibility to the central government, but much less so in the U.S., which has a different national strategy for LLRW. The developer of disposal facilities needs to know types and amounts of waste to be generated and in storage for designing, siting, and licensing of a disposal facility. Given that central governments may be responsible for developing LLRW disposal sites and centrally storing it as well, a national LLRW database is a valuable tool for implementing this strategy. In the U.S., private companies

[6] Several States developed requirements for LLRW reporting by their generators similar to that found in many foreign countries. The original purpose for such inventory reporting was to help plan for new disposal sites to be developed by the States or their regional LLRW Compact. Periodic reports are still published by these States that identify the generators, their location, the amount of waste in storage, including in some cases, the waste class, the radionuclides, and other information.

forecast waste management and disposal needs based on available information, such as the DOE MIMS, and their own market surveys.

NRC and Agreement States could promulgate a rulemaking to require the reporting of LLRW data. For the purposes of this report, the staff has assumed that such a rulemaking for LLRW reporting would be similar to the rulemaking for the national source tracking system. This rulemaking was compatibility category B, meaning Agreement States would have to adopt program elements essentially identical to those of NRC. The staff believes that this task would require a significant amount of resources. NRC resources to develop the rule could be 1 to 2 FTE. The 34 Agreement States would use, the staff estimates, a dozen or more FTE to implement the regulations in their States. Implementing the database would be dependent in part on how data is to be reported by generators and made available to the public, but assuming a web based system were used, similar to the NSTS, significant resources would likely be required.[7] In our LLRW Strategic Assessment, the staff ranked this task as low in priority, given its low benefits in relation to other potential NRC tasks. In addition, the NRC LLRW program is 5 FTE total, and development of a national database by NRC would require more resources than the size the current program, at least initially.

Conclusion:

Because the U.S. does not designate the Federal government as responsible for LLRW management and disposal, a national database as used in other foreign countries for planning national storage and disposal facilities would have much less utility here. A national database could be used by private companies for business planning for central storage and new disposal sites, and would also likely be of interest to the LLRW stakeholders in the U.S., which includes Federal agencies, public interest groups, professional societies, industry groups, private consultants, etc. Estimates of the amount of waste in storage can be made using existing databases. Sealed sources will be tracked in the NSTS database. On balance, given the resources required to expand the current LLRW data collection efforts and the reduced need for such a database in the U.S., the staff does not believe this approach should be pursued.

Prompt removal of higher activity LLRW from generator sites

Description:

GAO found that most foreign countries surveyed in their study use methods to promptly remove 'higher-activity LLRW' ('essentially disused sealed radiological sources') from generating sites in order to reduce safety and security risks. GAO also found that countries place time limits on the storage of these sources at generator sites, require that sealed sources be returned to their suppliers or be sent to a central storage facility when they are no longer in use, and have established orphan source recovery programs to collect sealed radiological sources that have been lost or abandoned. Removal of these higher activity sources from non-utility generator sites enhances security.

[7] If the system were similar to be NSTS, the most economical approach would be to adopt a copy of NSTS and make needed revisions. For this scenario, start-up costs would be approximately $5 million, and annual, recurring costs would be more than $2 million.

Evaluation:

The U.S. has recently addressed in depth the security of sealed sources and steps that need to be taken to improve it. The Energy Policy Act of 2005 (EPAct) established an Interagency Radiation Source Protection and Security Task Force under the leadership of the NRC to evaluate and provide recommendations to the President and Congress relating to the security of radiation sources (or "higher activity LLRW," as defined by GAO) in the United States from terrorist threats, including acts of sabotage, theft, or use of a radiation source in a radiological dispersion device. The Task Force was comprised of representatives from the NRC (chair), Department of Homeland Security, Department of Defense, DOE, Department of Transportation, Department of Justice (DOJ), Department of State, Office of the Director of National Intelligence (ODNI), Central Intelligence Agency (CIA), Federal Emergency Management Agency (FEMA), Federal Bureau of Investigation, Environmental Protection Agency, Office of Science and Technology Policy (OSTP), and Department of Health and Human Services (HHS). The Task Force included a nonvoting member representing the Organization of Agreement States (OAS) and the Conference of Radiation Control Program Directors (CRCPD). The Task Force members represented agencies with broad authority over radioactive sources of all categories, including regulatory, security, and intelligence, in addition to international activities. The Task Force reviewed existing programs and planned near-term activities and summarized the current practice or programs, as well as the planned activities, at the various agencies. Based on this information, the Task Force made a number of recommendations to enhance security. Its report was provided to The President in an August 15, 2006 letter from Chairman Diaz of NRC. The Task Force found that the current recovery programs for lost or stolen radioactive sources of all categories are effective in protecting public health and safety and providing for security of these sources.

The DOE collects and centrally stores sealed sources that pose a threat to national security. The Off-Site Source Recovery Project (OSRP) is a U.S. Government activity sponsored by the DOE's National Nuclear Security Administration's (NNSA) Office of Global Threat Reduction, and is managed at Los Alamos National Laboratory through the Nuclear Nonproliferation Division. OSRP's mission to remove excess, unwanted, abandoned, or orphan radioactive sealed sources that pose a potential risk to health, safety, and national security. OSRP has been able to recover more than 16,000 sources from over 600 sites in 49 States, the DC area, Puerto Rico and a number of foreign countries. The owners vary from individuals, small firms, or colleges having one source to large firms possessing hundreds of sources. As GAO has noted in past reports, some of the sources recovered by DOE are less than Categories 1, 2, and 3. Another U.S. program is designed to address further the safety and security of sealed sources. The Conference of Radiation Control Program Directors (CRCPD) and DOE/NNSA have entered into a cooperative agreement to support sealed source consolidation and disposal efforts at the State level. Called the "Source Collection and Threat Reduction" or "SCATR" Program, and implemented by CRCPD, SCATR's goal is to collect sources being stored and not used that pose a threat to public health and safety and could possibly be used for malicious intent. The CRCPD SCATR program is limited to sources that do not meet International Atomic Energy Agency's Category 1 and 2 sources. Examples of sources that would be eligible for the SCATR program include medical brachytherapy sources (137Cs and 226Ra), eye applicators, low activity sources that exceed the NRC 120-day half-life limit for decay-in-storage, long half-life industrial sources, and calibration sources. This program is limited to discrete radioactive material (sealed sources or vials but not scaled pipe), whether naturally occurring, or accelerator or reactor produced; and does not include transuranic isotopes (transuranic sealed

sources are recovered directly by OSRP). In addition, sources that have already passed through ten half-lives should not be registered for SCATR. Disposition of these sources, facilitated by CRCPD, could be disposal, recycling, or storage at another facility.

For other sources that have not been collected by DOE or addressed in the SCATR program, the U.S. regulatory approach emphasizes accountability of the licensees in possession of the radioactive material, including radioactive sources defined under the EPAct. This regulatory approach is aimed at protecting public health and safety and national security. The existing regulatory framework requires licensees to secure and control radioactive material at all times to prevent or reduce the potential for lost or stolen sources. This framework also requires routine inventory checks to ensure early discovery of lost or stolen sources. Timely reporting is also required for lost or stolen sources so that recovery operations may be initiated as soon as possible. Federal, State, and local governments work together to investigate and recover lost or stolen sources. Federal agencies, by working cooperatively with States, and authorized by the AEA, have the capability to address a wide range of situations, including recovering excess or unwanted sealed sources of all categories, as well as addressing issues related to lost, stolen, abandoned, and missing sealed sources. Recovery of excess or unwanted sources is important to the overall protection of public health and safety and the reduction of potential security threats.

As noted in the Task Force report, no absolute time limit exists for the long-term storage of sources. Several sections of NRC regulations encourage licensees to evaluate storage situations after 24 months. This period is long enough to allow licensees to set sources aside to meet business purposes. Holding a source in storage longer than 24 months usually indicates the lack of a strategy to use or dispose of the source. The Task Force stated that NRC should consider a new requirement for licensees to review and document the reasons for storage of risk-significant sources longer than 24 months. In SECY-07-0216, dated December 10, 2007, NRC staff provided the Commission an update to its implementation plan for the actions identified by the Task Force. A working group consisting of NRC, DOE, States and others is to be formed by October 1, 2008, to address time limits for storage, and a decision on whether a rulemaking is needed is to be made by October 1, 2009. This effort would consist primarily of an assessment of the costs for transfer or disposal versus the cost of storage and the licensee's expectation of eventually using the source again. Few risk-significant sources are actually stored for 24 months, so this requirement would be invoked only rarely. However, making licensees consider why they are storing a risk-significant source and whether it needs to be removed for central storage, recycling, or disposal, has several benefits. Such a requirement could make licensees more aware of the source's existence, trigger an evaluation of the adequacy of storage conditions, and encourage the use of sound business and regulatory principles that would lead to the removal of sources which should not remain in storage. Implementation of a maximum time limit may create a hardship for some licensees if disposal options for greater than class C (GTCC) waste are not available. Once disposal options for GTCC exist, the NRC should consider requiring a maximum time limit on the long-term storage of risk-significant sources not in use.

Conclusion:

GAO recommended that the U.S. LLRW program address prompt removal of sealed sources from users facilities. The U.S. program permits licensees possessing sealed sources to store wastes on site provided certain safety and security measures are implemented. NRC and the

Agreement States inspect such storage. Notwithstanding this U.S. approach, the DOE Offsite Source Recovery Program centrally stores a large number of unwanted and abandoned sealed sources from commercial licensees. CRCPD has also implemented a program to help facilitate lower activity sources that are no longer used. GAO also recommended the prompt removal of sealed sources from users facilities when they are no longer needed. The NRC, following up on a recommendation of the sealed source security Task Force, is examining whether a rulemaking to require removal of sources within a certain time frame is justified. Given the above, NRC staff believes that the U.S. program for addressing sealed sources and their prompt removal is adequate. Many have been removed, and other follow up actions are underway to determine what other improvements might be needed.

Central Storage and Alternative Disposal Options

Description:

GAO's report on foreign approaches found that a number of foreign countries use the following to facilitate LLRW management and disposal:

- Special alternative disposal facilities for very low-level waste (or low-activity waste) whereby it is removed from regulatory control as LLRW and may be disposed of, for example, in a municipal landfill. France has developed a special facility for low-activity waste that is similar to U.S. hazardous waste facilities.

- Clearance, or the release of radioactive materials from regulatory control for unrestricted use, including recycling. A number of foreign countries have adopted the IAEA guidance for clearance contained in RS-G-1.7, "Application of the Concepts of Exclusion, Exemption and Clearance."

- Storage of LLRW in centralized facilities rather than at individual users sites. GAO also identified the use of centralized storage facilities for sealed radiological sources. Centralized storage, in GAO's view, provides for enhanced safety and security.

Evaluation:

1) Alternative Disposal Facilities

With respect to disposal in alternative facilities, such as municipal landfills, this practice is currently allowed and used in the U.S. It is closely related to the clearance practices described below. Although the term "clearance" means the release of materials for unrestricted use, in practice, licensees release very low-level waste or low-activity waste for disposal in landfills or hazardous waste facilities that are permitted under the Resource Conservation and Recovery Act. NRC grants case-by-case disposal approvals for waste that is volumetrically contaminated using 10 CFR 20.2002, which provides for alternative methods of disposal not otherwise authorized in NRC's regulations. Typically these disposals are in landfills or hazardous waste facilities. SECY-05-0056, "Improving Transparency in the 10 CFR 20.2002 Process," dated March 9, 2006, describes the process and the extent of its use in the recent past.

The U.S. program would benefit if the disposal of LLRW in alternative facilities were made more consistent. To that end, in 2003, EPA published an Advance Notice of Proposed Rulemaking that would have defined conditions for disposal of very low-level waste (or low-activity waste),

which included naturally occurring radioactive wastes, mixed hazardous and LLRW ("mixed waste"), and low levels of LLRW. Because of higher priorities, EPA has deferred that rulemaking for the time being. EPA received more than 1500 comments opposing promulgation of the rule.

2) Clearance:

Similar to the alternative disposal options discussed above, the U.S. program currently allows clearance of materials with trace amounts of radioactivity.[8] NRC and Agreement States have extensive guidance for the clearance of materials and the disposal of materials in landfills and other non-licensed facilities. Existing guidance, which is widely used, is described in Appendix B to NUREG-1812, "Draft Generic Environmental Impact Statement: Controlling the Disposition of Solid Materials." This draft EIS was an attachment to the Commission paper, SECY-05-0054, dated March 31, 2005, a proposed rule for "disposition of solid materials."

In SECY-05-0054, the NRC staff provided a draft proposed rule to the Commission to amend 10 CFR Part 20, "Standards for Protection Against Radiation," to include radiological criteria for controlling the disposition of solid materials that have no, or very small amounts of, residual radioactivity resulting from licensed operations and that originate in restricted or impacted areas of Nuclear Regulatory Commission (NRC)-licensed facilities. The rule would have permitted many materials and wastes to be disposed of in landfills and had limited reuse options as well. The concentrations were based on IAEA's guidance in RS-G-1.7, "Application of the Concepts of Exclusion, Exemption and Clearance." More than 3500 letters and e-mails were received from different stakeholder groups, representing a wide range of views.

In a June 1, 2005, Staff Requirements Memorandum on SECY-05-0054, the Commission decided to defer the rulemaking. The Commission noted that the agency was faced with several high priority and complex tasks, that the current approach to review specific cases on an individual basis is fully protective of public health and safety, and that the immediate need for this rule had changed due to the shift in timing for reactor decommissioning.

3) Centralized storage:

The U.S., aside from the sealed sources discussed above, has limited centralized storage of LLRW at this time, and has had a limited need for it to date. Disposal facilities have been available for almost all LLRW generated by non-utility users of radioactive materials. Only greater-than-class C waste, the majority of which is generated by nuclear power plants and stored on their sites, has not had a disposal path.

Most LLRW in the U.S. has a disposal path into the foreseeable future. Low-activity waste is sent to a number of sites around the country, including RCRA hazardous waste landfills, and all LLRW generators have access to licensed disposal sites for their class A waste. Beginning next summer, however, when Barnwell closes most U.S. generators will no longer have access for class B/C waste disposal and will continue to have no disposal option for GTCC.

[8] There is not always a bright line between clearance and alternative disposal methods. Many licensees send materials that could be released for unrestricted use, such as recycling (i.e., "cleared"), to landfills. NRC's proposed rule in 2005 had some limited reuse options, but for the most part, provided for disposals in landfills.

Given these developments, the staff considered centralized storage of LLRW in that context. As with other approaches evaluated above, the U.S. national strategy for LLRW enables States and private companies to develop centralized storage facilities, if there is a need. At least one private company is investigating development of a centralized storage facility for class B/C waste that will no longer be eligible for disposal at the Barnwell LLRW facility. The development of this facility is consistent with other market-driven LLRW management in the U.S. over the last several decades, especially the extensive waste processing industry in this country. At least one State has considered central storage of waste generated by its licensees, but has deferred any action on such an approach for the time being.

In the meantime, NRC and the Agreement States ensure public health and safety of stored waste, particularly class B, C and greater-than-class C, through their regulatory programs. NRC is updating its LLRW storage guidance for non-utility generators, in anticipation of Barnwell closing and the greater storage of LLRW around the country. NRC and Agreement States will inspect such storage to ensure that generators are doing it safely and securely.

Conclusion:

Like foreign countries, the U.S. uses both clearance and alternative disposal methods for some of its LLRW. The U.S. has investigated rulemakings that would address both of these techniques, but both are on hold due to other higher priority work. Centralized storage for LLRW, aside from sealed sources, is limited in the U.S., and the number of non-utilities that could use centralized storage for their class B/C waste, which will soon have no disposal option, is small. NRC and Agreement State regulatory programs will ensure that this waste is stored safely.

Financial Assurance

Description:

GAO reported that half of the foreign countries surveyed require all non-utility LLRW generators to have sufficient financial assurance to cover the removal of radioactive waste from their sites. Other countries use other financial assurance approaches to ensure that the government is reimbursed for any sealed sources that it may need to recover from non-utility LLRW generators. As noted in the Task Force and GAO reports, disused sources are moving into prolonged storage because licensees are not required to have financial assurance to cover the disposal costs or otherwise appropriately disposition their disused sources. The Task Force report reiterated the concern that prolonged storage of disused sources can lead to possible misuse, abandonment, loss, or theft.

Evaluation:

NRC has placed financial assurance requirements on many aspects of LLRW management, including many non-utility LLW generators, and continues to evaluate this very important aspect of regulation. For instance, NRC staff is pursuing a rulemaking associated with financial assurance for so-called "legacy" sites. Furthermore, a recent EPAct-mandated Task Force chaired by NRC made a recommendation regarding the evaluation of financial assurance associated with Category 1 and 2 radioactive sources.

As stated in the Task Force report, the NRC regulations at 10 CFR 30.35, "Financial Assurance and Recordkeeping for Decommissioning," require financial assurance or a decommissioning funding plan for radioactive byproduct material licensees who possess byproduct material at activity levels above certain thresholds. For sealed sources, the thresholds are fairly high and only affect possessors of individual IAEA Category 1 sources or significant quantities of lower-activity sources. As a result, licensees that possess Category 1 and 2 radioactive sources may not need to have financial assurance for decommissioning. Some of these licensees may not have sufficient funds set aside to cover the costs of disposal or other appropriate disposition, potentially resulting in prolonged storage and possible misuse or abandonment. Because not all Category 1 and 2 sealed sources are subject to current NRC financial assurance requirements and to ensure that sufficient funds are set aside to disposition these sources properly at the end of their useful service, the Task Force recommended that NRC evaluate alternative financial assurance options. The evaluation is to include a broadening of the financial assurance thresholds in 10 CFR Part 30.35, a source-specific surcharge for disposal, and a universal disposal surcharge on all licensees. The evaluation will consider impacts to the regulated community and implementation approaches (e.g., the need for legislation and regulation development).

Given that unwanted sources in storage present higher vulnerabilities, DOE might need to recover more of them in the future if the commercial disposal site that currently accepts this non-GTCC waste from most states ceases to do so, as planned in 2008. Lacking a commercial disposal option, DOE anticipates storing this waste, rather than disposing of it at DOE sites, because, among other reasons, it does not want to undermine the responsibility the Congress gave the states to provide disposal availability for non-GTCC waste.

NRC has made plans to implement the recommendation in the Task Force Report. It will evaluate the financial assurance necessary for Category 1, 2, and 3 sources and will form a working group to complete the evaluation. The working group is to be formed by October 1, 2008, and a decision made on whether a rulemaking is needed by October 1, 2009.

Conclusion:

Financial assurance provisions in U.S. regulations may need to be revised and expanded to cover other types of material, particularly lower categories of sealed sources, and more in line with some foreign countries' approaches. This effort is underway now.

GAO Testimony - Nuclear Security: Actions Taken by NRC to Strengthen Its Licensing Process for Sealed Radioactive Sources Are Not Effective
July 2007
(GAO-07-1038T)

In its report, "Nuclear Security: Actions Taken by NRC to Strengthen Its Licensing Process for Sealed Radioactive Sources Are Not Effective" (GAO-07-1038T), the U.S. Government Accountability Office (GAO) made recommendations to correct weaknesses in NRC's materials licensing program that were identified during GAO's testing of the licensing program using covert investigative methods. The recommendations and a summary of progress during 2007 are provided below.

Recommendation 1

To avoid inadvertently allowing a malevolent individual or group to obtain a license for radioactive materials, NRC should develop improved guidance for examining NRC license applications. In developing improved screening criteria, NRC should consider whether site visits to new licensees should be mandatory. These improved screening criteria will allow NRC to provide reasonable assurance that licenses for radioactive materials will only be issued to those with legitimate uses.

Status:

The Pre-licensing Guidance Working Group enhanced existing pre-licensing guidance to require site visits for certain new licenses and provide enhanced screening criteria. The revised guidance provides instructions on processing new license applications to determine which applicants are unknown entities that will require further checks to determine legitimacy, as well as a site visit. The revised guidance also provides instructions on the process for performing additional screening checks on applicants, including more formal additional checks using existing NRC Office of Investigations' database resources. The guidance clearly identifies the roles and responsibilities of NRC Offices that will assist in the checks and provides additional guidance on the conduct of pre-licensing site visits to determine the legitimacy of applicants.

The revised guidance was sent to the NRC Regional Offices and the Agreement States for comment in October 2007. The Working Group obtained comments from the Regions and the Agreement States and considered all comments received. On January 15, 2008, the NRC transmitted the final revised guidance to the NRC Regions and the Agreement States and requested that they implement the guidance for a 3-month pilot period. Training for license reviewers was provided prior to the start of the pilot. Sessions held in each NRC Regional office, and by teleconference for the Agreement States. During the pilot, the NRC solicited comments from the Regions and the Agreement States to provide field experience to improve the final guidance.

This GAO recommendation remains open.

Recommendation 2

NRC should conduct periodic oversight of license application examiners so that NRC will be assured that any new guidance is being appropriately applied.

Status:

The Integrated Materials Performance Evaluation Program (IMPEP) performs periodic oversight of licensing and inspection programs in each NRC Regional Office and Agreement State using a series of performance indicators. The review team spends approximately 1 week in the applicable office interviewing technical staff, accompanying inspectors in the field, and reviewing documentation. The review team evaluates the NRC Regional Office's or Agreement State's implementation of any new guidance or initiative to ensure its proper application. Based on the findings in comparison to the evaluation criteria in NRC Management Directive 5.6, "Integrated Materials Performance Evaluation Program (IMPEP)," the review team makes an assessment of the overall program performance, as well as for each indicator. A report is provided on the performance of the Agreement State or the NRC Regional Office. Corrective actions, such as program-wide training, are implemented for any weaknesses identified by the review team.

As part of its response to the GAO findings and recommendations, the Materials Program Working Group and the Independent External Review Panel are examining the policies and procedures for periodic oversight of license reviewers to determine whether additional emphasis is needed. Each group's review will include as a minimum the NRC's specific licensing process, the NRC's import and export licensing processes, the IMPEP procedures and guidance, and the NUREG-1556 program-specific licensing guidance series.

In addition, the NRC Regional offices, through their Performance Monitoring Programs, perform periodic audits of licensing and inspection documentation to ensure that licensing and inspection procedures and guidance are being followed. A sample of licensing actions and inspections is taken to ensure that work across the organization as well as different types of work are included in the audit. The results of the audits are reviewed by managers and branch chiefs. Errors and omissions are discussed with individual reviewers. In addition, for any generic issues that are identified by the audit, corrective actions are taken at the division level, including division-wide training.

This GAO recommendation remains open.

Recommendation 3

NRC should explore options to prevent individuals from counterfeiting NRC licenses, especially if this allows the purchase of more radioactive materials than they are approved for under the terms of the original license.

Status:

The Materials Program Working Group evaluated short-term options to improve license verification. The Working Group has recommended that the NRC and the Agreement States develop mechanisms to verify that license information is accurate. Essentially, licensees will be

required to contact the responsible regulatory authority prior to transfer of radioactive materials to ensure that the recipient is authorized to receive the requested material in the requested amount. The staff is in the process of evaluating the merits of developing measures to preclude alteration of an existing license or production of a counterfeit substitute. Future improvements include a secure, electronic system where licensees will be able to verify license information and track transfers.

This GAO recommendation remains open.

GAO Report - Nuclear Energy: NRC's Workforce and Processes for New Reactor Licensing Are Generally in Place, but Uncertainties Remain as Industry Begins to Submit Applications
September 2007
(GAO-07-1129)

In its report, "Nuclear Energy: NRC's Workforce and Processes for New Reactor Licensing Are Generally in Place, but Uncertainties Remain as Industry Begins to Submit Applications" (GAO-07-1129), the U.S. Government Accountability Office (GAO) made recommendations to help the NRC better manage its new reactor application workload and ensure that its processes more efficiently and effectively facilitate these reviews. The recommendations and a summary of progress during 2007 are provided below.

Recommendation 1

Fully develop and implement criteria for setting priorities to allocate resources across applications by January 2008.

Status:

The NRC staff has prioritized all of its new reactor work within the following three categories: licensing, infrastructure, and construction inspection work. The licensing category has been further divided into three subcategories: design certification (DC) applications, early site permits (ESPs), and combined license (COL) applications; those licensing reviews that have been budgeted for in the fiscal year based on the applicants' letters of intent will have greater priority. The remaining applications will be reviewed based on the remaining available budget. The Resource Management Board, which is comprised of the Deputy Directors of each division of the Office of New Reactors (NRO), meets on a monthly basis to review resource needs and adjustments are made when necessary.

The NRC considers this recommendation to be closed.

Recommendation 2

Provide the resources for implementing reviewer and management tools needed to ensure that the most important tools will be available as soon as is practicable, but no later than March 2008.

Status:

The NRC staff has been provided the resources needed for implementing reviewer and management tools to ensure that the most important tools will be available as soon as practicable. For example, the agency has provided training to staff on the use of the Enterprise Project Management (EPM) system. This system provides comprehensive information technology tools that integrate resource and schedule planning functions with the actual tracking of resource hours expended on a project. EPM is designed to facilitate efficient workflow and schedule management for the agency. Management and staff have loaded resources and hours into the EPM and are using the tool to manage and track resources and review status for the new reactor projects (ESPs, DCs, and COL applications). The agency continues to provide

training to improve staff's skill with EPM. In addition, procedures have been provided that guide all levels of users in the operation of EPM.

Additional tools are being developed to assist in the review of DC and COL applications. In FY 2007, the NRC completed updates to key infrastructure documents, such as the standard review plan and regulatory guidance for applicants preparing COL applications. The staff has built templates to assist reviewers in preparing their written safety evaluation reports (SERs) for COL applications associated with different reactor designs. The templates, applications, key reference documents, and project management tools are available on an electronic platform that provides an integrated work space for the NRC staff. Additionally, the agency is developing a knowledge management tool, called Wizard, which is an electronic system for preparing and tracking requests for additional information (RAIs). These tools are expected to be available for staff use by the second quarter of FY 2008.

The NRC will close GAO Recommendation 2 after the tools discussed above are developed and made available for staff use. This is expected in the second quarter of FY 2008.

This GAO recommendation remains open.

Recommendation 3

Clarify the responsibilities of NRO's Resource Management Board in facilitating the coordination and communication of resource allocation decisions.

Status:

The staff has proposed revisions to Chapter 6 of the New Reactor Licensing Program Plan, Change Management, which clarifies the roles and responsibilities of NRO's Resource Management Board (RMB) in facilitating the coordination and communication of resource allocation decisions. The roles and responsibilities of the RMB are being reviewed by NRO staff and management and will be issued in a revision to the New Reactor Licensing Program Plan in the very near future.

The NRC will close this GAO recommendation after the issuance of the revised New Reactor Licensing Program Plan.

Recommendation 4

Enhance the process for requesting additional information by providing more specific guidance to staff on the development and resolution of RAIs within and across design centers and explaining forthcoming workflow and electronic process revisions to COL applicants in a timely manner.

Status:

The NRC uses various administrative tools to ensure that the review process works efficiently and that RAIs do not unreasonably delay the completion of the NRC review. Upon receipt of an application, the staff has been trained to perform an initial review to ensure the application includes sufficient information. To ensure that questions posed during the review have a nexus

to the ultimate agency decision regarding an application, the NRC has structured a format for RAIs. Each question is reviewed and approved by management before a formal request is sent to an applicant.

In lieu of identifying RAIs based on the application's content, the staff has been trained to follow a process whereby a draft SER with open items will be written; and the gaps that are identified in the SER will form the basis for RAIs sent to applicants. This process reduces the number of RAIs and ensures that the additional information requested from the applicant is needed to support the agency's decision-making process.

In addition, to ensure that applications contain the necessary information in a consistent format, and to reduce the number of RAIs, the staff has issued various guidance documents for use by applicants. The NRC staff continues to hold routine meetings with the industry to discuss issues of content and format of applications.

The NRC has implemented tracking systems for ongoing DC reviews and has developed an improved electronic system for creating, approving, and tracking questions to applicants. The electronic system will be deployed for use during the NRC review of the first COL applications and will include the ability to identify questions and responses from DC and COL reviews.

The NRC will close this recommendation after the tracking system has been deployed, which is expected to occur in the second quarter of FY 2008.

GAO Report - Nuclear Security: DOE and NRC Have Different Security Requirements for Protecting Weapons-Grade Material from Terrorist Attacks
September 2007
(GAO-07-1197R)

In its unclassified summary report, "Nuclear Security: DOE and NRC Have Different Security Requirements for Protecting Weapons-Grade Material from Terrorist Attacks" (GAO-07-1197R), of a classified report about the same topic, the U.S. Government Accountability Office (GAO) made recommendations to address the differences in actions to protect Category I special nuclear material at Department of Energy (DOE) sites and NRC licensees. The recommendation that remained open as of the NRC's last report and a summary of progress during 2007 are provided below.

Recommendation 2

NRC should expedite its efforts to ensure that its licensees have the same legal authorities to acquire heavier weaponry and use deadly force as DOE sites currently have to protect such material.

Status:

The Energy Policy Act of 2005 provided the NRC the Federal authority to permit the use of enhanced weaponry (e.g., machineguns) at Commission-designated classes of facilities and during the transport of designated materials. The NRC had sought this enhanced authority after the September 11, 2001, terrorist attacks. Following the statute's enactment, the NRC has worked closely with the Department of Justice (DOJ), the Federal Bureau of Investigation and the Bureau of Alcohol, Tobacco, Firearms, and Explosives to develop the firearms guidelines mandated by the statute. Development of the firearms guidelines raised many legal, policy, and technical issues and has taken a greater amount of time than originally anticipated. The firearms guidelines are undergoing final review within the NRC in the second quarter of FY 2009, and will then be submitted to the Attorney General. In order to implement this new authority as expeditiously as possible, the NRC published in October 2006 a proposed rule that was based on the draft of the guidelines that existed at that time. However, subsequently there were significant changes made to the guidelines at DOJ's request. The staff is developing recommendations to the Commission on the most expeditious means to promulgate a final rule and to take the other necessary actions to implement the statute and thereby permit Category I facilities to obtain and use enhanced weapons.

The NRC agrees with GAO that clarification of the authority of security forces to use deadly force in the protection of Category I material could enhance their protective response. The NRC also understands that the DOJ's position on this issue is that such clarification should occur under the State law applicable to such facilities. The NRC continues to explore potential avenues to clarify the use of deadly force by private security personnel.

This GAO recommendation remains open.