

February 21, 2007

Mr. Gene Aloise, Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street NW
Washington, D.C. 20548

Dear Mr. Aloise:

Thank you for the opportunity to review and submit comments on the January 2007 draft of the U.S. Government Accountability Office's (GAO's) report entitled "Low-Level Radioactive Waste Management: Approaches Used by Foreign Countries Would Provide Useful Lessons for Managing U.S. Radioactive Waste" (GAO-07-221). The U.S. Nuclear Regulatory Commission (NRC) appreciates the time and effort that you and your staff have taken to prepare this report.

In the report, GAO identifies a number of low-level radioactive waste (LLRW) management approaches used in other countries. The GAO recommends that the NRC and the U.S. Department of Energy (DOE) evaluate and report back to Congress within one year on the usefulness to the U.S. of adopting certain LLRW management approaches discussed in the report and the potential costs to develop a U.S. national radioactive waste management plan.

For the reasons discussed below and in the Enclosure, NRC believes a stand-alone study may not be the most effective means to evaluate the usefulness of adopting many of the LLRW management approaches discussed in the report. We believe it would be more effective to consider the LLRW management approaches through ongoing efforts being conducted in the U.S., such as NRC's assessment to identify needed improvements to the LLRW regulatory program, and through organizations with broad representation of U.S. stakeholders, such as the Interagency Steering Committee on Radiation Standards. The results of such efforts could be reported in our annual letter to Congress that addresses progress in completing actions in response to recommendations in multiple GAO reports.

It is important to note that systems for LLRW management in various countries have evolved differently than in the U.S., due to many factors such as culture and public sentiment, systems of government, public policy, and geography. Such differences have precluded adoption in the U.S. of some of the approaches used in other countries. It is important to consider these factors in comparing systems for LLRW management and assessing the transferability of best practices among countries.

As noted in the GAO report, NRC is currently conducting a strategic assessment of its LLRW program to ensure that NRC's regulatory framework will continue to ensure the safe management of LLRW. Many of the waste management practices noted by GAO are being evaluated in the strategic assessment. Further, NRC and other U.S. stakeholders have previously considered and evaluated several of the approaches discussed in the GAO draft report, and either determined that the approaches were not practical or not necessary to ensure safety and security of LLRW. The report could be better informed by acknowledging these past

and ongoing U.S. efforts to consider approaches used to manage LLRW in other countries, especially in cases where the approaches ultimately were not implemented.

Additional information on the above general comments and our detailed comments, along with those of the Chairman of the NRC's Advisory Committee on Nuclear Waste, are enclosed. If you have any questions on our comments or would like to discuss these issues further, please contact Ms. Melinda Malloy of my staff at (301) 415-1785.

Sincerely,

/RA/

Luis A. Reyes
Executive Director
for Operations

Enclosure: Comments on Draft Report

General Comments

NRC Staff

1. The U.S. Government Accountability Office (GAO) report states that the U.S. is lacking an integrated national radioactive waste management plan. However, GAO does not identify the national problem that it believes could be solved by the implementation of such a plan. The report did not acknowledge that, in large measure, the Low-Level Radioactive Waste Policy Amendments Act (LLRWPA) was an attempt to formulate and encourage States to implement such a plan, nor did the report refer to efforts of various States in forming low-level radioactive waste (LLRW) compacts with the purpose of developing regional disposal facilities. It is considered by many that the LLRWPA did not achieve its desired outcome. Legislative changes would likely be needed before the development of a national radioactive waste management plan could substantively improve the U.S. system. The U.S. Nuclear Regulatory Commission (NRC) notes that the costs to develop a U.S. radioactive waste management plan would be significant, and that the benefits of such a plan are unclear, particularly given the complex composition of the current U.S. system.

2. It is important to note that systems for LLRW management in various countries have evolved differently than in the U.S., due to many factors such as culture and public sentiment, systems of government, public policy, and geography. The U.S. system relies on a broad spectrum of private and public entities to manage radioactive wastes, while most European Union (EU) countries rely on national (government) disposal solutions. The U.S. program is highly complex, involving numerous governmental and commercial organizations that generate, process, dispose of LLRW, and regulate these activities, under different legislative authorities and a patchwork of laws that speak to the various forms and origins of radioactive waste. Within the EU, most national authorities have primacy over the LLRW management program, and there are no provisions to relinquish regulatory authority to the individual provinces in Europe. Developing a waste management plan for the U.S. would be much more difficult and complex, owing to the nature of the program, than for many countries that have programs with a limited number of organizations and waste generation rates. It is important to consider these factors in comparing systems for LLRW management and assessing the transferability of best practices among countries.

3. While most of the U.S. LLRW stakeholder group representatives interviewed by GAO for this study suggested the need to evaluate alternative ways to manage LLRW in the U.S., they did not cite the development of a national waste management plan as a means for accomplishing this. The GAO report states that, in the absence of a national radioactive waste management plan, interested parties in the U.S. lack a means to identify radioactive waste quantities and locations, forecast future storage and disposal needs, assess research and development opportunities, determine appropriate safety and security requirements, and prepare contingency plans. While the current U.S. radioactive waste management system is complex and diffuse, these issues are addressed in large part by the current system. For example, safety and security requirements are specified by Federal agencies and Agreement State authorities, while LLRW storage and disposal needs and research opportunities are forecasted by a combination of public and private sector entities. Contingency planning is performed by the respective groups that comprise the system according to their roles.

Enclosure

4. It is important to note that the national radioactive waste management plans for France, Germany, and Spain, which are cited as examples in the report, were formulated by either a national-level ministry or national waste management organization that does not exist in the U.S. system. The NRC agrees that in some instances, an integrated approach by Federal and State authorities is needed to make progress toward improvements in the U.S. system. However, NRC believes that groups such as the Interagency Steering Committee on Radiation Standards (ISCORS) constitute a more appropriate and efficient mechanism for achieving this coordination. Both State and Federal officials (including the U.S. Department of Energy (DOE)) participate in ISCORS.

5. Before finalizing the current report, it is suggested that the GAO contributors conduct a thorough examination of the wealth of information and data provided, analyzed and peer-reviewed in the international Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention). The basis for lessons to the U.S. LLRW program would be more completely informed by reviewing the National Reports required by the Joint Convention. All but one of the 20 surveyed countries (Mexico is not a Contracting Party to the Joint Convention) were subject to detailed review of their LLRW management program, including inventories of waste stored and disposed. Furthermore, questions and comments were provided to all of the Contracting Parties on details of their waste management programs, after thorough review by all of the other Contracting Parties. There are now 44 Contracting Parties, including the U.S., the Peoples Republic of China, and Russia.

6. The NRC and DOE have mature, robust programs for international information exchange and are actively engaged in learning about successful radioactive waste management practices used in other countries as well as sharing best practices from the U.S. This learning and exchange occurs through mechanisms such as participation in the Joint Convention, in International Atomic Energy Agency (IAEA) meetings and the development of IAEA safety standards and guides, in the Nuclear Energy Agency (NEA) Radioactive Waste Management Committee, and via a number of other formal and informal interactions. In carrying out these activities, the U.S. is looked to as a world leader in safely managing radioactive waste and plays a leadership role in developing international regulatory practices. The NRC will continue its efforts to share best practices with its international and domestic counterparts and to incorporate those practices that can be implemented within the U.S. regulatory system.

7. The NRC is focused on the continuous improvement of its programs, including its LLRW regulatory program. As noted in the report, NRC is currently conducting a strategic assessment of its LLRW program to ensure that NRC's regulatory framework will continue to ensure the safe management of LLRW and will promote regulatory stability, reliability, and efficiency. Many of the waste management practices noted in the GAO report are being evaluated in the strategic assessment. Further, NRC has previously considered and commented on several of these practices. For example, in our response to GAO's 2004 report on LLRW disposal availability (GAO-04-604), we commented on the utility of a national LLRW tracking system and noted that the regulatory costs of implementing such a system are not balanced by the negligible benefits. Disposal capacity needs have been and will continue to be accurately forecasted absent a national radioactive waste inventory database through a combination of public and private sector efforts by DOE, waste generators, disposal site operators, and other industry groups. The NRC continues to believe that implementation of a national database is not needed to ensure safe LLRW management and would impose an unnecessary burden on

Agreement States, NRC, and U.S. licensees. NRC also believes that agency resources can best be used to continue efforts that have already been identified as needed improvements to the LLRW regulatory program.

8. Because the U.S. is one of the countries considered in the survey process, it would be informative and instructive for the comparison tables throughout the report to include the U.S. in one of the columns. This would help provide a better insight into which countries may have approaches which could result in improvements to the U.S. program.

9. The GAO report notes that other countries make extensive use of landfills for disposal of low-activity radioactive waste, and that several countries allow materials with small amounts of residual radioactivity to be exempted from regulatory control. The NRC currently has a case-by-case exemption process to allow for the alternate disposal of some low-activity radioactive waste in landfills or hazardous waste facilities. The NRC and the U.S. Environmental Protection Agency have explored options for a general exemption or clearance provision for low activity waste, but have faced significant opposition to these proposals. In the 1992 Energy Policy Act, Congress gave States the authority to regulate the disposal of LLRW exempted from regulation by NRC in response to State concerns regarding NRC plans at that time to exempt certain low activity materials. Then in 2002, NRC initiated a rulemaking to facilitate the disposition of certain solid materials with no, or very small amounts of, residual radioactivity resulting from licensed operations, but deferred action on this rulemaking in 2005. The reasons for deferring action were 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.

10. The NRC has financial assurance requirements for many aspects of LLRW management, including provisions that apply to many non-utility LLRW generators. The NRC continues to evaluate this very important aspect of regulation, and is currently pursuing a rulemaking associated with financial assurance for "legacy" decommissioning sites. As noted in the GAO report, a recent report from the Interagency Radiation Source Protection and Security Task Force, which was chaired by NRC, recommended an additional evaluation of financial assurance requirements associated with licensees that possess Category 1 and Category 2 radioactive sources.

11. A careful examination of terminology is necessary to fully appreciate how different Nations employ terms such as "practices," "waste," "clearance," "background," and others. For example, the "Front End of the Nuclear Fuel Cycle" means different things in the international arena. For regulatory purposes, the front end of the U.S. nuclear fuel cycle is the uranium processing of ore, sometimes referred to as milling. For other countries the term would include conventional mining of uranium or thorium ore and the associated mine spoil, which is at radioactivity levels typical of mine spoils from other industrial resource development.

12. There appears to be an interchangeable use of terms such as LLRW and orphaned sources. Although high-activity sources are generally LLRW, albeit greater than Class C (GTCC), not all LLRW forms are composed of disused sealed sources.

13. Throughout the report the Radiation Source Protection and Security Task Force (Task Force) is referred to as the U.S. Nuclear Regulatory Commission (NRC) Task Force. This is misleading. The Task Force was chaired by NRC, as directed by the Energy Policy Act, but it was an interagency task force and should be referred to as such.

14. The authors may need to view and evaluate the U.S. LLRW management program through integration of the functions and activities of Federal and State authorities and the private sector. In addition, the authors should recognize the safe management of LLRW in the U.S. over the past decades considering actual data for: (a) volume of waste disposed; (b) workers exposure records; (c) public exposure records; and (d) environmental impacts.

Comments from the Chairman, Advisory Committee on Nuclear Waste (ACNW)

Observation: The GAO report specifically addresses GTCC wastes (higher activity yet short-lived) and low activity wastes. GAO observed that much can be done to improve the management of these wastes. They examined how the Europeans manage these wastes and also sought advice from stakeholders in the regulated and regulator communities.

1. The GAO report makes two recommendations for Congress to consider: (1) that the NRC Chairman and the U.S. Department of Energy (DOE) Secretary evaluate the usefulness of adopting European LLRW management practices described in their report; and (2) that the NRC Chairman and the DOE Secretary identify the steps, authorities, and potential costs associated with developing a (comprehensive) radioactive waste management plan. Note: The report is silent on the role of the U.S. Environmental Protection Agency (EPA) in setting generally applicable standards for radioactive waste management. While currently shared among several Federal agencies and State agencies through the Agreement States program, the U.S. does have a comprehensive radioactive waste management program. It is just not centralized in one agency and has developed over time.

2. The GAO report would be strengthened by including the detailed information that is included in the ACNW's final report on LLRW regulation in the U.S. (NUREG-1853). Some of the issues that the GAO report addresses have been addressed in the ACNW's letter of August 16, 2006, that accompanied the NUREG-1853 report. The NUREG report and the ACNW letter may provide some additional insights to GAO and would be a useful foundation for any further discussions.

3. The focus of the GAO report is primarily on the management of commercial LLRW at high concentration and low concentration ends of the LLRW classification system. One key difference is that the U.S. radioactive waste management system relies on a mix of private and government initiatives to manage radioactive wastes. Most European countries rely on national government disposal solutions.

4. The GAO report makes reference to radioactive waste management practices focused on the Organization for Economic Cooperation and Development (OECD)/Nuclear Energy Agency (NEA) Member States. However, there is no detail for each country's programs. Such information is available in the OECD/NEA publication, "Radioactive Waste Management Programmes in OECD/NEA Member Countries," Issy-les-Moulineaux, NEA Radioactive Waste

Management Committee, 2005. It is a compendium report covering radioactive waste management practices in 20 OECD/NEA Member Countries.

5. GAO makes reference to the need to exempt certain radioactive wastes from regulation. However, the GAO report does not acknowledge in their report past NRC experience with de minimis wastes and Below Regulatory Concern policy, on which Congress later pre-empted Commission action. This is discussed in NUREG-1853.
6. The first GAO recommendation would be clearer if a new table to the report that correlates European and U.S. management practices used as the basis for the recommendation. It would be helpful if the GAO report recommended specific practices that should be considered for adoption in the U.S.

Detailed Comments

NRC Staff

1. Page 5, 1st full paragraph, 2nd sentence from the end of the paragraph. It is incorrect to say that the National Source Tracking System (NSTS) will not include some sealed radiological sources that are considered a security risk. NRC follows the IAEA Code of Conduct for the Safety and Security of Radioactive Sources and considers Category I and Category II sources to be a safety and security risk. We have implemented Orders for the protection of Category I and Category II material and all of those materials will be tracked in the NSTS. Smaller sources in the aggregate can be considered a risk, however, individual sources are not.
2. Page 5, 1st paragraph, last sentence. It does not follow that sealed sources stored at generator sites “. . . represent the largest pool of potential orphan sources.” Generators are under license and required to manage the material they possess. Periodic inspections verify the adequacy of such management.
3. Page 6, sentence starting on line 3. The online version of the NSTS will allow licensees to provide information on whether a source has been put in storage and will no longer be used. This information is not required, because it cannot be justified on a security or safety basis, but can be provided voluntarily.
4. Page 7, bottom of page. Here GAO speaks to the process by which NRC filled out the survey in collaboration with DOE and others. GAO does not, however, speak to the collaborative process, or lack thereof, that may have characterized other responses. To the extent that this information is available, it should be provided.
5. Page 9, 1st full paragraph. The report states that, “Fourteen out of 18 countries surveyed use methods to promptly remove higher activity LLRW from waste-generating sites in order to reduce safety and security risks.” Table 5 of the report and question 16 of the questionnaire do not agree with this formulation. It appears that the correct statement should be: “Fourteen out of 18 countries we surveyed have methods in place to facilitate removal of disused radiological sources from user sites.”

6. Page 9, 1st full paragraph. The report states that, “To facilitate the removal of higher-activity LLRW, **almost all countries** surveyed require that sealed radiological sources be returned to their suppliers when they are no longer in use” [emphasis added]. Table 5 and question 13 address whether **implemented** requirements obligate disused radioactive sources to be returned either to the manufacturer of the source (**or to central waste storage?**). A check of the cited countries’ National Reports indicate that either the sources are sent to a central waste storage facility or there are contract provisions to return the sources to the supplier/manufacturer. This would suggest that the statement cited above overstates the likelihood of return of sources to suppliers.
7. Page 9, top of page and page 13, 2nd paragraph, last sentence. The inference that the Task Force “. . . generally supported the usefulness of . . . a national LLRW database” is improper. The Task Force did not address a national LLRW inventory database.
8. Page 10, 1st paragraph, last sentence and page 31, top of page. This language overstates the recommendations in the Task Force report, dated August 15, 2006. In this report, the Task Force did recommend that, “NRC **evaluate** the financial assurance required for the possession of Category 1 and 2 radioactive sources to assure that funding is available for final disposition of the sources.” [emphasis added]. The Task Force report states that NRC should include in the evaluation a source-specific surcharge for disposal and universal disposal surcharge. The way the GAO report is written it implies that the Task Force **recommended** these options.
9. Page 11, 1st full paragraph line 13-14. The statement “. . . this Code, which the U.S. has agreed to support . . .” should be changed. The word “support” should be more accurately changed to “implement.”
10. Page 13, lines 6-7. In the sentence beginning, “This category of waste . . .”, it is not clear to which category of waste the report is referring.
11. Page 14, last paragraph and Table 2. While the report provides some information on the practices of some countries related to radioactive sources, it provides little insight into the number of sources involved or the number of licenses.
12. Page 18, 1st full paragraph. The discussion in the paragraph related to Task Force recommendations related to Category 3 sources is misleading. The Task Force report does not discuss the **need** for a more comprehensive national inventory of risk-significant sources. The Task Force report does suggest that an **analysis for inclusion** of Category 3 sources be conducted. The suggestion is offered not because of a need for a comprehensive list but so the issue can be resolved.
13. Page 18, bottom paragraph. Herein detailed information would be useful regarding specific methods and techniques employed by various countries to ensure the prompt removal of higher activity waste. Some countries and/or companies do not allow disused sources to be returned. So, for instance, how do they require a company in a foreign country to take back the source?
14. Page 22, middle of page. It is not clear how a foreign source supplier could be required to take back a source. Also, it is acknowledged elsewhere throughout the report that return of the

source to the supplier is not always feasible and that some countries employ other disposition methods.

15. Page 23, 1st paragraph, last sentence. Here again there is a misleading reference regarding the Task Force report. The Task Force recommends that the Government should further reevaluate waste disposal options as outlined in previous GAO reports, it did not specify higher activity or very low-level waste. The Task Force report context is Category 1 and Category 2 sources.

16. Page 33, paragraph regarding financial assurance. The report states that some stakeholder representatives suggested that NRC should provide other methods than the self-guarantee for small businesses that cannot self-guarantee. ("Self-guarantee" is a method in NRC regulations at 10 CFR Part 30, Appendices C, D, and E.) It should be noted that NRC regulations provide three other methods to provide financial assurance for decommissioning costs: prepayment, sureties, and a sinking fund combined with a surety.

17. Appendix I, page 45. In the discussion of NRC's plans to revise financial assurance regulations, the report states that NRC plans to address the "coverage gap" that allows some non-utility waste generators to use radioactive materials without providing financial assurance to cover future LLRW disposal costs. The revised regulations are not expected to extend financial assurance requirements to licensees that are currently outside the scope of the regulations. The revisions will address the problem of "legacy sites . . .," that is, sites that are within the scope of the regulations requiring financial assurance but that permanently cease radiological operations without adequate funds to complete decommissioning. The revised regulations are intended to address problems with funding large, complex sites, which may include extensive soil and groundwater contamination. Disposal of small sealed sources is not part of the rulemaking plan, and the "legacy site" revised rules are not intended to address the "coverage gap."

ACNW

1. Page 6, footnote 6. The GAO report cites the early draft of the ACNW White Paper. There is a more current reference for the White Paper as NUREG-1853. NUREG-1853, the ACNW LLRW White Paper, has been posted electronically on the NRC Web site at:

<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1853/>.

2. Pages 9, 13. Doesn't DOE already collect LLRW data for the Manifest Information Management System? Also, NRC staff heard from the Nuclear Energy Institute last month that the Electric Power Research Institute (EPRI) is also now collecting LLRW data, with a 75 percent response rate from industry. The report should be amended to reflect this.

3. Page 12, Table 1. A comparable table for the U.S. would be useful as a way of further identifying differences in approaches to radioactive waste management.

4. Appendix II, page 50, Table 10. DOE was not interviewed for the purposes of this report. DOE is responsible for managing LLRW and GTCC wastes which fall within the scope of this

report. DOE is currently in the process of preparing a draft GTCC Environmental Impact Statement which is not acknowledged. DOE also manages a considerable amount of LLRW which appears not to have been studied by the GAO.

Also, EPRI, representing the nuclear utilities, and the Army Corps of Engineers, which has a significant role in managing low activity wastes from the Formerly Utilized Sites Remedial Action Program, were not interviewed.