

March 25, 2005

Mr. James E. Wells, Jr.
Director, Natural Resources
and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

Dear Mr. Wells:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am writing to thank you and your staff for providing us the opportunity to review and comment on your draft report concerning the material control and accounting (MC&A) of spent nuclear fuel. Your willingness to engage the NRC staff throughout the review process is very much appreciated.

Overall, the NRC believes the report to be well written and balanced. Although the NRC generally agrees with the conclusions reached by the U.S. Government Accountability Office (GAO), I would note that significant NRC attention had been redirected to the MC&A area prior to the commencement of the GAO review. The ongoing efforts by the NRC staff to address many of these same issues are worthy of mention.

Prior to September 11, 2001, spent fuel was well protected by physical barriers, armed guards, intrusion detection systems, area surveillance systems, access controls, and access authorization requirements for employees working inside the plants. Since September 11, 2001, NRC has significantly modified its requirements, and licensees have significantly increased their resources to improve security at spent fuel facilities and nuclear power plants. The results of security assessments completed to date clearly show that storage of spent fuel provides reasonable assurance that public health and safety, the environment, and the common defense and security are adequately protected.

The NRC believes that the likelihood that an adversary could steal spent fuel from a spent fuel pool or storage cask is extremely low, given the security and radiation protection measures in place and the ease of detectability and intense, physically disabling radiation from the spent fuel.¹ The actions the NRC has already taken, as well as the actions being taken, are adequate when considered in the full context of power plant security. Consequently, the NRC does not consider the threat of a knowledgeable, active insider stealing a spent fuel rod, or portion thereof, to be credible. The NRC believes that an insider could not overcome the multiple

¹The systems and tools used to manipulate spent fuel in pools are designed to prevent an individual from inadvertently raising spent fuel to the surface of the pool, due to the dangerous levels of radiation. Consequently, an insider would have to circumvent specific design features of the tools and equipment, circumvent sensitive radiation detectors surrounding the spent fuel pool, circumvent radiation detectors in the remainder of the plant (e.g., the radiological control boundary), and circumvent radiation detectors at the protected area boundary egress points to remove a spent fuel rod successfully from a reactor site. Further, the sensitivity of these radiation detectors increases as one moves further away from the reactor since these systems are part of the licensee's personnel radiation protection program. Finally, the radiation levels from unshielded spent fuel rods would typically be physically incapacitating within a few minutes and lethal shortly thereafter.

physical issues and sensitive radiation detectors, both around the pool and throughout the plant associated with preventing the removal of spent fuel rods or pieces from the pool. Furthermore, the physically disabling radiation would prevent an insider from surreptitiously removing the spent fuel from the reactor site for use in a radiological dispersal device (RDD).

As the GAO review indicated, some spent fuel pieces have recently been reported missing or unaccounted for from spent fuel pools; but, for the reasons listed above, there is no reason to conclude that any of the missing or unaccounted for material was removed for any malevolent purpose. Additionally, for all the missing or unaccounted for fuel rods or pieces identified to date, the initiating events occurred decades ago. In response to these events, the NRC has implemented MC&A inspections under the Temporary Instruction (TI) 2515/154, "Spent Fuel Material Control and Accounting at Nuclear Power Plants," issued on November 26, 2003. The NRC is also scheduled to complete the following activities:

- development of guidance concerning control and accounting of rods and pieces;
- development of guidance concerning the conduct of physical inventories; and
- revision of existing procedures for inspecting MC&A of spent nuclear fuel to include instructions on inspecting control and accounting of rods and pieces.

In addition, the NRC plans to conduct additional, more detailed inspections under TI 2515/154 at plants where questions regarding potential weaknesses in MC&A practices still exist. On February 11, 2005, the NRC issued Bulletin 2005-01, "Material Control and Accounting at Reactors and Wet Spent Fuel Storage Facilities," to obtain additional information to assist the staff in deciding which facilities will be selected for these inspections.

In NRC's view, the GAO report does not make sufficiently clear that the problems at Vermont Yankee were identified as a direct result of NRC's implementation of TI 2515/154. Implementation of the TI also helped identify the problems at Humboldt Bay. Although NRC agrees with the report's conclusion that licensees' efforts to account for and control spent fuel are uneven, this knowledge also came from the NRC inspections and responses to the TI, as did the knowledge that the biggest problem is accounting for and controlling pieces of spent nuclear fuel as opposed to assemblies. Additionally, performance-based approaches are often more effective and efficient at achieving the desired outcomes than prescriptive approaches. As a result, dictating how licensees are to meet the MC&A requirements is not necessarily the most effective and efficient approach.

The draft report also stresses the importance of timely action. Providing the broader perspective of overall NRC activities that have occurred since the events of 9/11 is important contextual information. For example, development and issuance of the TI was postponed by the need to devote NRC's limited resources to areas requiring more immediate attention, especially the comprehensive security and radiological protection activities conducted after 9/11.

With regard to the measures taken by the NRC since issuance of TI 2515/154, the report needs to provide balance by giving credit to NRC for making prioritized decisions based on a variety of factors, including but not limited to, risk of malevolent action, attractiveness of material for potential malevolent activities, other controls, and available personnel resources. Such a context is not present in GAO's report. As noted above, there is no reason to conclude that any of the missing fuel segments were removed for any malevolent purpose. There is an important accounting issue for fuel rod segments, but not a security or safety issue.

Finally, I would like to note that the current regulations (10 CFR 74.19) are clear and do not appear to need revision. Licensees are already required to keep complete records of and conduct annual physical inventories of all special nuclear material. "All special nuclear material" means not only large spent fuel items, but also loose rods and pieces. The NRC agrees that implementation guidance does need to be enhanced to address loose rods and pieces of spent nuclear fuel and the NRC is working to complete the guidance.

As you are aware, the NRC and GAO staffs have had multiple exchanges regarding the report's contents and context. These exchanges have been very beneficial. Should you have questions or concerns on these additional comments, please contact Ms. Melinda Malloy, of my staff at (301) 415-1785.

Sincerely,

/RA/

Luis A. Reyes
Executive Director
for Operations