December 17, 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:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am providing an unclassified version of the NRC's comments on the U.S. Government Accountability Office's (GAO's) classified draft report about the security of research and test reactors. A detailed and classified version of these comments was provided by letter dated September 4, 2007. We ask that this unclassified version of our comments be included, in its entirety, in the unclassified public version of GAO's final report.

The NRC is pleased to be afforded this opportunity to comment on this draft report. Unfortunately, we found that this report provides an unbalanced assessment of the efforts of the NRC and Research and Test Reactor (RTR) licensees to enhance security after September 11, 2001. Additionally, this report lacks sound technical bases and credible intelligence information in support of GAO's recommendations and the NRC strongly encourages GAO to make substantial changes to the report.

Safe and secure RTRs are a part of campus landscapes around the country, providing education and training to the next generation of scientists and engineers. Currently, there are 32 operating NRC-licensed RTRs in the United States. These RTRs support a wide variety of scientific programs including biology, chemistry, physics, and medicine. A number of scientific and medical advancements can be attributed to RTRs, including improved cancer treatment therapies that have increased survival rates, and evidence that resulted in the now widely accepted asteroid impact theory on the extinction of the dinosaurs.[1] For perspective, the majority of NRC-licensed RTRs are less than 1 Megawatt-thermal (MWt), and range in size from 5 Watts – about the size of a standard nightlight in a child's bedroom – up to 20 MWt. In comparison, the typical operating nuclear power plant in the United States is rated to 3000 MWt and can power over 1 million homes.

GAO Misrepresents NRC Actions to Enhance Security

GAO's report misrepresents the considerable efforts made by the NRC following September 11, 2001, to assess and enhance the security of RTRs. Security measures for RTRs are based on a "graded" approach that is derived from the requirements of Section 104.c. of the Atomic

[1] National Research Council. (1988). *University Research Reactors in the United States – Their Role and Value.* Washington, D.C.: National Academy Press.

Energy Act of 1954, as amended, which directs the NRC to impose the minimum amount of regulation necessary to protect the public health and safety and the common defense and security. In general, RTRs that possess larger quantities of nuclear material or material that is potentially more attractive to adversaries have enhanced security measures in place. In the remaining months of 2001, after September 11th, the NRC issued advisories with recommended security precautions based on on-site evaluations. From 2002 to 2004, the NRC established additional security measures at RTRs in a prioritized manner. During this time RTRs implemented compensatory measures, which included site-specific background investigations of personnel with access to the reactors. All RTR licensees have committed to incorporate these additional security measures into their security plans or procedures. The NRC ensures that the compensatory measures remain in place through our regulatory processes, which include Confirmatory Action Letters and on-site inspections. Additionally, background checks of all individuals with unescorted access to the NRC-licensed RTRs found no issues. Furthermore, the NRC requested and received, in the Energy Policy Act of 2005, the authority to require Federal Bureau of Investigations (FBI) identification and criminal history records checks, based on fingerprints, of any person with access to Safeguards Information or unescorted access to RTRs. In September 2006 and April 2007, respectively, the NRC implemented this authority through Orders to all RTRs.

GAO's report misrepresents NRC's use of Sandia National Laboratories' (SNL) security assessments. GAO asserted that the NRC dismissed SNL's reports because we did not agree with its results. That is untrue. As we previously discussed with GAO's staff, the NRC's research and test reactor technical staff carefully reviewed SNL's reports and determined that, while some of its assumptions and methodologies were unrealistically conservative, the reports were useful. In fact, the NRC's experts used input from SNL's reports in the development of a comprehensive decision-making framework which applied a risk-informed methodology in the evaluation of potential security enhancements. In 2006, after applying this framework to RTRs, the NRC determined that additional security enhancements were unnecessary due to the minimal risk these facilities pose to public health and safety. The NRC staff repeatedly cautioned GAO that SNL's modeling and assumptions used in the reports had limitations and that SNL's results alone did not provide a risk-informed basis for making regulatory decisions. GAO's report does not reflect NRC's caution and instead presents elements of the SNL reports out of their proper context.

GAO's comparison of security requirements for NRC-licensed and DOE-operated RTRs provides an incomplete and inaccurate representation of their safety and security. It should be noted that of the Department of Energy's (DOE) four RTRs, two are significantly larger than any NRC-licensed RTR. Furthermore, DOE's security requirements are based on the weapons-grade nuclear material handled and stored elsewhere on the site and not the RTRs themselves. Requirements such as Federal security clearances and protection against Design Basis Threats, while reasonable for a DOE facility where access is restricted due to the presence of significant quantities of highly classified and controlled strategic nuclear material, are inappropriate for a low-power, NRC-licensed RTR.

Experts Question Key Facts in GAO's Report

The NRC has determined that GAO's report misrepresents or excludes key facts. GAO's recommendations appear to be based predominantly on a pre-decisional sample document[2] demonstrating Idaho National Laboratory's (INL) capabilities and on opinions from Federal agencies and other labs, such as SNL. However, the NRC is aware that both INL and SNL provided written comments to GAO prior to the completion of the draft report refuting GAO's characterization of some of their work and key facts in the report.

After reviewing GAO's Statement of Facts, INL provided written comments regarding GAO's representation of work INL performed for GAO. INL's June 13, 2007, letter[3] to GAO's lead reviewer clearly stated that, "INL formally requests that the GAO not include or refer to in any fashion any INL technical judgments contained in the INL pre-decisional sample document." INL further explained that the document was prepared as a demonstration of the lab's capabilities and had not been reviewed either externally or internally by experts. Furthermore, INL stated that the report had not been reviewed for the, "reality of the scenarios and the engineering credibility of the attack systems and the example reactor conditions with recognized authorities." Since GAO issued its draft report for comment, NRC has confirmed INL's position on verbal communications, which GAO refers to in its draft report. "In line with INL's position of the proposal we provided to GAO, that it not be included or referred to in their report, our position is the same for verbal information exchanged with the GAO. Those conversations were conducted in order to define information to scope our proposal to GAO, not to provide technical information or facts."[4] Therefore, INL finds that inclusion and reference to the sample pre-decisional INL report in GAO's report detracts from its technical credibility, and INL indicates that its pre-decisional, sample document and associated verbal communications are not to be included or referred to in GAO's report.

Similarly, SNL, after reviewing GAO's Statement of Facts, provided written comments regarding GAO's characterization of SNL experts. SNL's comments to GAO fundamentally challenged the information used by GAO to claim that the NRC had not appropriately considered terrorist capabilities. SNL noted that GAO's Statement of Facts contained no mention of Sandia's views regarding the viability or practicality of the assumed terrorist scenarios. SNL further stated in its comments that despite providing GAO with a subject matter expert who refuted GAO's assumptions, GAO failed to acknowledge key scientific facts that challenged the basis for using the GAO-identified terrorist capabilities. Despite SNL's comments to the contrary, GAO's report represents these presumed terrorist capabilities as credible threats and a basis to challenge NRC's security requirements for RTRs.

Not only did GAO misrepresent the experts cited in its report, it also failed to acknowledge those experts' formal dissenting views. A fundamental principle of good decision-making is the consideration and inclusion of all relevant facts and information, even those that contradict one's conclusions. The NRC does not understand how GAO can exclude formal comments from national laboratories that it claims are experts and still conclude that it's characterization of RTR

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[2] Schrader, Bradley J. Ph.D., PE, CHP. (April 2007): "Evaluation of a Pseudo TRIGA reactor for Radiological Sabotage." (This document is OUO).

[3] Letter from Hill, David J. INL Deputy Laboratory Director, Science and Technology, to Ruedel, Peter, GAO: "INL Response Regarding GAO Use of INL Evaluation of Research Reactors," 13 June 2007.

[4] Email from Landon, Chad J., INL, to Mendonca, Marvin, NRC: "Re: Info." August 15, 2007.

security is credible and balanced. INL's written comments are provided as Enclosure 1, to this letter.

GAO's Assumptions Lack a Sound Technical Basis

GAO's report assumes that a highly unlikely combination of events could damage an RTR and release radioactivity to the environment. GAO does not provide credible intelligence information or supporting technical bases for their postulated terrorist scenarios. Despite many meetings between the NRC and GAO staff where the NRC pointed out the significant limitations, challenges, and realisms that would make the scenarios highly unlikely, GAO's report continues to characterize them as credible without providing any supporting technical basis or analysis.

GAO's report assumes that terrorists could employ highly sophisticated methods and skills to cause significant damage to an RTR. GAO's report however, provides no supporting intelligence information that terrorists have demonstrated this capability. The NRC maintains an expert and dedicated team of threat assessment specialists with over 150 years of combined experience working in the intelligence community. This team applied NRC's rigorous threat assessment process, which GAO commended as "logical and well-defined,"[5] in determining credible terrorist capabilities. The NRC continually reviews intelligence information and when appropriate revises its assessment of credible terrorist capabilities.

In addition to the lack of credible intelligence information, GAO did not provide a sound technical basis to demonstrate that an RTR could be damaged as GAO assumes. As stated previously, GAO's own experts, SNL, challenged GAO's assumptions regarding the viability or practicality of GAO's postulated methods to damage an RTR. SNL provided a series of detailed scientific facts that support the view that GAO's postulation is highly unlikely. Further questioning the technical bases of GAO's scenario, Los Alamos National Laboratory (LANL) conducted a classified engineering and safety analysis, published as a classified report in 1990, that specifically analyzed methods similar to those postulated by GAO. LANL's analysis concluded that RTRs are resistant to the postulated attack due to their design and materials of construction. Additionally, LANL's classified analysis determined that the accomplishment of such scenarios would encounter significant challenges. During the course of NRC's security assessments performed since September 11, 2001, we found that law enforcement response provides a high degree of confidence that responders would successfully thwart the attack scenarios assumed by GAO. Additionally, the scientific work of LANL found that even if an adversary were successful in overcoming these restraints, the upper limit on the radioactivity released would be far less than the assumptions made by GAO. The conclusions reached in 1990 remain valid in the post-9/11 environment because the scientific principles they are based on have not changed.

GAO's evaluation and assumptions ignore the physical realities of RTR design and construction and the likely effects of the postulated scenarios on the terrorists that would prevent an attack from being successful in damaging an RTR. NRC and SNL staff reviewed GAO's scenarios and concluded that considerable resources and time would be necessary, if it would be possible at all. LANL's classified engineering and safety analysis reached the same conclusions as the

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[5] Government Accountability Office. (March 2006). *Nuclear Power Plants: Efforts Made to Upgrade Security, but the Nuclear Regulatory Commission's Design Basis Threat Process Should Be Improved*. (Publication No. GAO-06-388).

NRC staff, which has over 220 combined years of experience regulating, operating, and managing RTRs.

GAO also assumed that upon damaging an RTR, a large, direct release of radiation would occur. NRC and LANL analyses have already shown that the probability of causing sufficient damage to an RTR such that a large release would occur is extremely low. In addition, the design and construction features present real world barriers to the release of radioactivity to the environment. These features were conveniently ignored in the GAO evaluation. Although questioned in the report, GAO does not provide any supporting technical basis to challenge the adequacy of the existing RTR emergency plans.

The NRC believes that the inaccuracies, misrepresentation, and unsupported assumptions discussed above undermine the credibility of the evidence presented in the draft report, which thus does not support a sound technical basis for its conclusions and recommendations. The NRC strongly encourages GAO to make substantial changes to the report in order to enhance its accuracy and thereby provide a convincing and fair presentation of the physical security of NRC-licensed RTRs.

Again, thank you for the opportunity to comment on this report. Should you have any questions about these comments, please contact Ms. Melinda Malloy, at (301) 415-1785, of my staff.

Sincerely,

/RA/

Luis A. Reyes
Executive Director
for Operations

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