

June 26, 2003

Mr. Robert A. Robinson  
Managing Director, Natural Resources and Environment  
United States General Accounting Office  
441 G Street, NW  
Washington, DC 20548

Dear Mr. Robinson:

I would like to thank you for the opportunity to review and submit comments on the draft report, "NUCLEAR SECURITY: Federal and State Action Needed to Improve Security of Sealed Radioactive Sources" (GAO-03-804).

We believe the draft report does not fully present either the current status of our efforts to improve the security of high-risk radioactive sources or the large effort that we have devoted to this issue over the past eighteen months. It also reflects a limited outline of our existing statutory framework and does not recognize that several of its recommendations would require statutory changes at both Federal and State levels.

This report perpetuates one of the main problems of an earlier GAO report (GAO-03-638), namely its failure to focus on high-risk radioactive sources, which are of greatest concern for malevolent use by a terrorist. As I wrote you in commenting on that report, the vast majority of radioactive sources in use in the United States and abroad are not useful to terrorists. For example, iodine-131 and technetium-99m should not be included in any list of radionuclides of concern, as your draft report does in two places.

The Commission has already done the following to improve the security of high-risk radioactive sources:

- 1) Together with the Department of Energy (DOE) we have defined the radionuclides of concern and action levels for those radionuclides. Working with appropriate Federal agencies, particularly the Department of State (DOS), we have sought to reconcile the DOE/NRC definition of high-risk radioactive sources with that being developed by the International Atomic Energy Agency (IAEA) in its draft TECDOC-1344. We believe that international consensus will soon be reached on TECDOC-1344 so that we can reach international consistency on this critical definition.
- 2) We, together with DOE and DOS, have ensured that the United States has taken a leadership role in developing the draft IAEA Code of Conduct on Safety and Security of Radioactive Sources, a document which we hope will be finalized at the September IAEA General Conference Meeting.
- 3) The Commission has issued numerous advisories on security of sources, the most important of which was the advisory issued on March 17, 2003, at the initiation of Operation Liberty Shield. Working with our Agreement State colleagues, we assembled a list of approximately 2100 NRC or Agreement State licensees whose licenses permit them to possess greater than NRC/DOE action level quantities of the radionuclides of concern, and promptly issued the advisory to them. That advisory specified the

additional security measures which we felt appropriate with the Nation at the orange threat level.

- 4) The Commission issued an Order to large panoramic irradiators on June 6, 2003, the detailed security measures of which are safeguards information under Section 147 of Atomic Energy Act.
- 5) The Commission has established a Materials Security Working Group involving both the Agreement States and the Conference of Radiation Control Program Directors (CRCPD) to ensure close coordination in the development of additional security orders to those licensees possessing category 1 or 2 quantities of radionuclides of concern as defined in TECDOC-1344 (a slight variation from the DOE/NRC action levels) and to deal with other materials security issues. The Commission discussed resolution of this issue with the leadership of the Organization of Agreement States (OAS) and CRCPD on June 6, 2003.

The Commission has plans in place to do the following:

- 1) In the very near term the Commission, in partnership with the Agreement States, will determine an initial inventory of high-risk radioactive sources (e.g., sources containing category 1 and 2 quantities of radionuclides of concern as defined in the latest version of TECDOC-1344) in the possession of all NRC and Agreement State licensees.
- 2) The Commission will develop a requirement for tracking such sources, as envisioned in the draft IAEA Code of Conduct on Safety and Security of Radioactive Sources.
- 3) The Commission will develop, in consultation with DOS and other agencies, an export and import control system for high-risk radioactive sources, again as envisioned in the IAEA Code of Conduct, and ensure the compatibility of our system with those of other countries.

The Commission fully recognizes that cooperation with our Agreement State colleagues is vital to the success of our efforts. The Commission must also work within the existing statutory framework. That framework reserves to the Commission the common defense and security authorities of the Atomic Energy Act. Moreover, section 147 of the Atomic Energy Act permits only the Commission, not the States, to prescribe that detailed security measures to protect byproduct material or special nuclear material be protected as safeguards information. These considerations have guided the Commission's approach to the security of high-risk sources in Agreement States. The possibility of State budget shortfalls played absolutely no role in the Commission's decision-making.

We have issued the June 5, 2003 Order to panoramic irradiator licensees based on the existing statutory framework. These additional security measures go beyond what would be required in a safety framework; they are actually done under common defense and security.

The Commission is not opposed to potential changes in our statutory framework and will explore such changes in the Materials Security Working Group. However, we are also not prepared to advocate any such changes today. Any changes at the Federal level will almost certainly entail change in State laws. Any such effort to amend statutes at both the Federal and

State levels will take time. In the meantime, the Commission intends to work with the States to the maximum extent possible under existing statutes and in particular to utilize agreements pursuant to section 274i of the Atomic Energy Act to contract with the Agreement States for assistance in security inspections.

The enclosure provides specific comments on these matters . Should you have any questions about the NRC's comments, please contact either Mr. William Dean, at (301) 415-1703, or Ms. Melinda Malloy, at (301) 415-1785, of my staff.

Sincerely,

*/RA/*

William D. Travers  
Executive Director  
for Operations

Enclosure: Specific Comments on Draft Report GAO-03-804

cc: Ryan Coles, GAO

## SPECIFIC COMMENTS ON DRAFT REPORT GAO-03-804

1. On the Highlights page, under the section "What GAO Found," we recommend that the 2<sup>nd</sup> sentence in the 3<sup>rd</sup> paragraph be updated to read as follows:

"NRC has been developing additional security measures since the [September 11, 2001] attacks, and ~~expects to~~ issued the first security orders to large facilities that irradiate such items as medical supplies and food ~~before the end of~~ on June 5, 2003."

2. On the Highlights page, other changes should be made depending on how other NRC comments are dispositioned.
3. On page 1, line 2, delete "iodine-131" and substitute "cesium-137." Iodine-131 is not useful in a dirty bomb and is not a radionuclide of concern. For similar reasons delete footnote 1. Neither iodine-131 nor technetium-99m are radionuclides of concern.
4. On page 1, GAO should consider adding a footnote that the term "radiological dispersion device" also includes the subset of "radiological exposure devices (REDs)" where there is no explosive dispersal. In defining radionuclides of concern and setting action levels for those radionuclides, the RED scenario is often the most limiting and is probably the only way that an individual could get a dose that would induce "radiation sickness," the phrase used on line 14. Alternatively, if the focus is purely on explosive RDDs, we recommend changing the phrase "radiation sickness" on line 14 to "radiation exposure," and changing "potentially increase long-term risks of cancer for those contaminated" to "potentially lead to a very small increase in the long-term risk of cancer for those exposed." The Commission's March 2003 "Fact Sheet on Dirty Bombs" (enclosed) may be useful in amending this paragraph.
5. On page 2, line 2, footnote 2, add at the end: "Section 274m also reserves the common defense and security authorities of the Atomic Energy Act to NRC." Since this is such a fundamental point, it may deserve to be in the main text. This point is made in the main text on page 30, lines 5 and 6, but its significance is not appreciated there either.
6. On page 2, line 1, add the words "for the protection of public health and safety" after "primary regulatory authority."
7. Remainder of page 2 - - there is nothing wrong with this discussion except that by discussing all sealed sources, it diverts attention from the principal problem, control of high-risk sources. Note that in addition to specifically licensed sources and generally licensed sources, NRC and Agreement State regulations (10 CFR Part 30) also provide for exempt sources (such as americium-241 used in smoke detectors in homes).
8. On page 4, under the section "Results in Brief," the 4<sup>th</sup> sentence of the 1<sup>st</sup> full paragraph incorrectly states that the NRC and Department of Energy (DOE) efforts to examine options for a national sealed source tracking system do not include the 32 agreement states (see line 7). As correctly reflected on page 9, line 4 of the report, the effort has had limited agreement state involvement. We suggest that the sentence on page 4 be revised to read as follows:

Enclosure

“NRC, in cooperation with DOE, has begun examining options for developing a national sealed source tracking system, but this effort is limited in scope; importantly, it does not include the 32 and has had only limited involvement of the agreement states.”

9. On page 6, under the section “Results in Brief”

- The 1<sup>st</sup> sentence of the 1<sup>st</sup> paragraph (line 5) states that the NRC has not required any specific actions to improve the security of sealed sources since the terrorist attacks of September 11, 2001. This statement is misleading in that the NRC has identified specific actions and has issued advisories to licensees to take actions, although it is true that the NRC had not issued legally binding orders during the time frame of the GAO’s review. The NRC has issued orders to large irradiator facilities, as discussed in Comment 1. We recommend that the 1<sup>st</sup> and 2<sup>nd</sup> sentences in the 1<sup>st</sup> paragraph be revised to read as follows:

“Since the terrorist attacks..., NRC, along with the agreement states, has notified licensees via advisories of the need for heightened awareness to security and the need to take certain actions, but has not issued legally binding orders ~~required any specific actions~~ to improve the security of high-risk sealed sources. NRC has been developing specific additional security measures since the attacks, and ~~expects to~~ issued orders on June 5, 2003, to strengthen security to at large irradiator facilities before the end of 2003.”

- In the 2<sup>nd</sup> paragraph, the 2<sup>nd</sup> and 3<sup>rd</sup> sentences should be revised as follows to more correctly state the authority given to the NRC by the Atomic Energy Act and to clarify that the NRC has already taken actions with respect to implementation of additional security measures for large irradiator facilities, including those licensed by Agreement States:

“The Atomic Energy Act of 1954 ~~gave~~ gives NRC the authority to issue rules, regulations, or orders to ~~protect~~ promote the common defense and security and to protect the public health and safety. Based on this authority, NRC intends to ~~develop and implement all additional security measures for~~ order licensees with high-risk sealed sources, including those licensed by agreement states, to implement additional security measures. NRC has already done so for large irradiator facilities.”

- The 2<sup>nd</sup> paragraph discusses the role of the States in regulation of sealed source security, and should clarify that while common defense and security functions are a Federal responsibility, the NRC is planning to exercise its authority under Section 274i. of the Atomic Energy Act to contract with the States for assistance in security inspections. This would balance the discussion of roles and resource challenges, and is consistent with information appearing in the 2<sup>nd</sup> sentence of the 2<sup>nd</sup> paragraph on page 31 of the report.

- In the 2<sup>nd</sup> paragraph, we suggest inserting the following information after the 5<sup>th</sup> sentence:

“NRC has initiated a Materials Security Working Group, which includes the states, as a mechanism for discussing and identifying potential resolutions to these issues.”

10. On page 4, last line, after “recovered,” insert the following sentence: “In fact, only one high-risk source has been lost and not recovered in the last five years in the United States and it would no longer be considered a high-risk source because of radioactive decay.” This point is made on page 17 in the main text, but deserves to be here as well.
11. On page 5, line 1, insert “high-risk” before sealed sources.
12. On page 5, lines 4 and 5, the text is wrong in stating that NRC and DOE “do not include an analysis of sealed sources in agreement states.” For purposes of determining which sealed sources are high-risk, it does not matter whether the sealed source is in an Agreement State or under NRC jurisdiction. The effort to categorize sources and define high-risk radioactive sources is, as discussed in the cover letter, in its final stages on a global basis as TECDOC-1344 is being finalized. The Commission agrees that an initial inventory of high-risk sources both in NRC and Agreement States needs to be carried out, and directed the staff to do this on March 31, 2003. The staff is in the final stages of preparing to do this in partnership with the Agreement States.
13. On page 5, at the bottom of the page, the Commission questions the need for all new sealed source licensees to be inspected immediately. There may be a need for the inspection of new licensees whose license will permit the possession of high-risk sources.
14. On page 5, near the bottom, the recommendation that NRC’s IMPEP program evaluate the security of sealed sources reflects a misunderstanding of the section 274’s reservation of common defense and security authority to NRC. The IMPEP program already evaluates the effectiveness of Agreement State safety programs for sealed sources. These safety programs have a modest security component but have not been designed to cope with terrorist threats.
15. On page 6, the entire second paragraph needs significant reworking in light of the points made in our cover letter. NRC is following the existing statutory framework. NRC is not arguing that “the agreement states lack the staff and funding to carry out the additional responsibility of securing sealed sources.”
16. On page 7, line 8, delete “technetium-99.” Possibly add “americium-241” to be consistent with page 1.
17. On pages 7 and 8, you may want to make reference to exempt sources.
18. On page 9, the Commission does not believe that it is appropriate to track all sealed sources (nor does the draft IAEA Code of Conduct). The focus of any inventory system and cradle-to-grave controls needs to be on high-risk sources. Any attempt to track every source from cradle to grave will lead to costs far exceeding any security or safety

benefits. As also mentioned in our cover letter, by March 17, 2003, NRC had, with the assistance of the Agreement States, put together a listing of all 2100 licensees whose licenses permit the possession of greater than DOE/NRC action level quantities of the radionuclides of concern. The NRC will work in the Materials Security Working Group to put together a tracking system for high-risk sources in both NRC and Agreement States.

19. On pages 9-14, the discussion would have been more useful if it had focused on the 2100 licensees who may possess high-risk sources, not all 19,770 specific licensees.
20. On page 14, line 7, "cesium-153" should be changed to "cesium-137."
21. On pages 15-16, the discussion under "NRC Has Had Difficulty Finding Owners of Generally Licensed Devices" is accurate, but irrelevant to a discussion of security of high-risk sources.
22. On page 17, line 2, as described in the cover letter, not only have DOE and NRC already characterized sources by their level of risk, the United States Government as a whole is close to being able to endorse a revised IAEA TECDOC-1344, which categorizes sources essentially the same as the DOE/NRC report (within a factor of 2 or 3 for every radionuclide of concern). On line 3, clearly on categorization, NRC's and DOE's efforts have addressed sealed sources in Agreement States, and indeed worldwide through IAEA.
23. On page 19, line 8 and following, the DOE/NRC report did consider Agreement State licensees (although it did not have the data we now have on Agreement State licensees potentially possessing high-risk sources). Moreover, DOE and NRC did consider both naturally-occurring and accelerator produced radioactive materials and determined the only radionuclide of concern in those categories was radium-226.
24. On page 19, the criticism that the DOE/NRC (and IAEA) methodologies for categorizing sources do not explicitly address psychological and economic consequences is misleading. In setting NRC/DOE action levels for alpha and beta-emitting radionuclides of concern, NRC and DOE modeled what amount of each radionuclide would be necessary to contaminate one half square kilometer to a 2 rem/year level (the EPA intermediate protective action guideline). This was very much an effort to have a measure of economic disruption, since the health effects of a 2 rem exposure would be small. As stated by the NRC official quoted on line 3, we are aware of no metric of psychological disruption, and our efforts and those of other agencies in a real event would be devoted to minimizing societal disruption by providing accurate information about health consequences (again see enclosed NRC Dirty Bomb fact sheet).
25. On pages 22 and 23, "Current Licensing Process Leaves Sealed Sources Vulnerable," there may be merit in pre-licensing inspections or hand delivery of a license if the license permits possession of high-risk sources.
26. On page 25, Table 2 should be corrected to reflect that an Integrated Materials Performance Evaluation Program review of Region IV was conducted in April 1999. All performance indicators were found to be satisfactory and the final determination of the program was adequate. This correction obviates the need for the note at the end of the table that indicates that no evaluation of the effectiveness had been conducted for Region IV at the time of the GAO review.

27. On page 26, under the section “NRC Efforts to Improve Security over Sealed Sources Have Been Limited and Disagreement Exists over the Appropriate Role of the States,” although it is true that the NRC had not issued legally binding orders during the time frame of the GAO’s review, orders have been issued to large irradiator facilities. Therefore, the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> sentences are not correct as written and should be revised to reflect the issuance of these orders on June 5, 2003. See also Comments 1 and 9.
28. On pages 27 through 30, the section “NRC’s Security Efforts Have Not Focused on Sealed Sources” simply does not begin to convey the extent of NRC’s efforts in this area over the past 18 months. Please see Dr. Travers’ cover letter.

In addition we make the following points:

29. On page 27, under the section “NRC Efforts to Improve Security over Sealed Sources Have Been Limited and Disagreement Exists over the Appropriate Role of the States,” lines 3-5 indicate that 80 percent of the Agreement States feel they should be responsible for inspecting and enforcing security measures for sealed sources in their States under their authority to ensure public health and safety. Consistent with suggestions provided in Comment 5 and 9, we suggest that the report clarify that security measures relate to the common defense and security functions that are exclusively a Federal responsibility, and the NRC is planning on exercising its authority under Section 274i of the Atomic Energy Act to contract with the States for assistance in security inspections. These changes will conform the discussion in this section with the information appearing on page 31 of the report (see 2<sup>nd</sup> sentence of the 2<sup>nd</sup> paragraph).
30. Page 27, under the section “NRC’s Security Efforts Have Not Focused on Sealed Sources,” states that NRC efforts have focused on issuing advisories and orders for non-materials licensees. We suggest replacing “non-materials” with “nuclear reactor and nuclear fuel” because nuclear fuel facilities are a type of materials licensee.
31. On page 28, under the section “NRC’s Security Efforts Have Not Focused on Sealed Sources,” in the 1<sup>st</sup> full paragraph, the 3<sup>rd</sup> and 4<sup>th</sup> sentences are not correct as written and should be revised to reflect the fact that the NRC has issued orders to large irradiator facilities. See also Comments 1 and 9.
32. On page 29, under the section “NRC’s Security Efforts Have Not Focused on Sealed Sources,” the 2<sup>nd</sup> and 3<sup>rd</sup> sentences in the 2<sup>nd</sup> full paragraph indicate that when new security orders are issued, affected licensees will have 180 days to comply with the orders. Until the orders are issued, it cannot be said how long licensees will have to comply. Although most, but not all, orders already issued have given licensees 180 days to comply with the specific security requirements, this may change for future orders depending on factors such as the materials involved and the security measures to be implemented. We suggest revising these sentences as follows:

“When these orders are issued, affected licensees will have ~~180~~ days a specified time period to comply with the order...At the end of this ~~180-day~~ period, licensees will be subject to inspections to ensure compliance...”



33. On page 30 and following, under the section “NRC and Agreement States Disagree over Development and Enforcement of Additional Security Regulations,” we refer you to the cover letter.

Two specific comments on the very end of this section are:

34. Page 32, under the section “NRC and the Agreement States Disagree over Development and Enforcement of Additional Security Requirements,” the 2<sup>nd</sup> sentence states that it is uncertain how NRC would implement enforcement action against an Agreement State license. We believe this statement should be deleted because there is no question as to the NRC’s authority to enforce common defense and security requirements.
35. On page 32, we recommend revising the 3<sup>rd</sup> complete sentence as follows:
- “While final details regarding funding have yet to be determined, NRC anticipates ~~increasing its licensees’ fees and using~~ having sufficient funds from Homeland Security appropriations to cover costs associated with additional security.”
36. On page 32, “Conclusions,” we will not make specific comments except to point out significant revision would be required if our other comments are accepted.
37. On page 33, under “Recommendations for Executive Action,” the Commission would urge that the recommendations be revised consistent with our comments along something like the following lines:
- 1) NRC, in partnership with other agencies, should ensure that TECDOC-1344 and the IAEA Code of Conduct are finalized as soon as possible. (NRC is doing this.)
  - 2) NRC should, as a first step toward control of high-risk sources, inventory all 2100 NRC and Agreement State licensees whose licenses indicate they may possess such sources. (NRC is doing this.)
  - 3) NRC in partnership with the Agreement States should bring its licensing system for high-risk sources and its export/import licensing system into conformance with the IAEA Code of Conduct as soon as possible. (NRC is doing this and would note that a relatively minor aspect of this effort would be whether some currently generally licensed sources should be specifically licensed.)
  - 4) In the interim NRC and the Agreement States should ensure that new specific licenses authorizing the possession of high-risk sources be issued only after verification that the sources will be issued as intended. (NRC is considering this.)
  - 5) NRC and the Agreement States, through the Materials Security Working Group, should consider the advisability of amendments to current statutes that would permit the States to regulate the security of high-risk radioactive sources. (NRC will be doing this.)

38. Page 34, under the section “Recommendations for Executive Action,” includes a recommendation that the NRC Chairman ensure that officials in Agreement States and non-Agreement States participate in the development, implementation, and enforcement of additional security measures. It is not clear how participation in enforcement would be accomplished. The NRC has the sole authority to take enforcement action for common defense and security requirements. Agreement States may have a role to assist NRC in inspections if they enter Atomic Energy Act 274i Agreements. Non-Agreement States have no formal role, although the NRC could inform them. To focus the recommendation such that it is consistent with the law, we suggest the following revision:
- “... • ensure officials in agreement and non-agreement states participate, consistent with current law, in the development, implementation, and enforcement of additional security measures and...”
39. On page 42, under the section “Teletherapy,” we suggest changing “brain” to “cancer” because fixed multibeam teletherapy units are used to treat cancer lesions in other parts of the body, not just the brain.
40. On page 45, under the section “Well logging gauge,” please note that well logging devices are usually not referred to as gauges. Therefore, we suggest changing all instances of the words “gauge” or “gauges” to “device” or “devices.”