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FINAL REPLY:

Representative Edward J. Markey

TO:

Chairman Meserve

FOR SIGNATURE OF : ** PRI ** CRC NO: 01-0643

Chairman

DESC:

Questions Regarding Use of Nuclear Materials

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Advance

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December 4, 2001

The Honorable Richard A. Meserve
Chairman
Nuclear Regulatory Commission
Washington D.C. 20555

Dear Mr. Chairman:

Documents uncovered in Kabul, published interviews with and statements by Al Qaeda members, and other evidence all indicate that terrorists may be actively seeking to acquire nuclear materials for a nuclear explosive device, or even a crude radiological explosive device. Today's Washington Post reports that Osama bin Laden and his Al Qaeda terrorist network may have made greater strides than previously thought toward obtaining plans or materials to make a crude radiological weapon that would use conventional explosives to spread radioactivity over a wide area. And last week, former CIA Director James Woolsey co-authored an article in the New York Times that warned:

> "A deeply disturbing picture of terrorist intent has emerged in recent weeks as blueprints for building nuclear weapons have been discovered in the wreckage of abandoned Al Qaeda safe houses. These blueprints and other documents, while largely available in the public domain, sharpen the need for a vigorous American policy to deal with unsecured nuclear, chemical and biological materials. Even if terrorist manufacture of nuclear bombs is unlikely, substantial dangers remain of terrorists using radioactive material in low-tech "dirty" bombs.
>
> "The main nuclear security problem posed by Al Qaeda today is access to radioactive materials in Pakistan. However, for a decade we have focused on the former Soviet Union. Since the end of the cold war, approximately 175 incidents of smuggling or attempted theft of nuclear materials there have been thwarted. But the threat remains, as the Russian Defense Ministry reported on Nov. 6, when the last attempt at theft was made."

While former Director Woolsey's article focused on the threat to nuclear materials abroad, in light of the threat that all such efforts pose to our national security, I would like to once again direct the Commission's attention to an ongoing breach in the security and safeguarding of nuclear materials here at home.

As you will recall, on December 20, 2000 I wrote you regarding an Event Report filed with the Commission (Daily Event Report #37596, December 15, 2000) which indicated that two radioactive spent fuel rods were missing from the Millstone Nuclear Power Station Unit 1. The report suggested that they may have been lost since approximately 1980 and that their loss was discovered only during the course of document reviews undertaken in connection with the decommissioning of Unit 1.

In your February 1, 2001 response to my inquiry, you requested that I "recognize that we are early in our review of this event and are still pursuing clarification of a number of issues." You also indicated that "the licensee is conducting its investigation and we will continue to monitor its actions." You also stated in your letter that:

> "...[L]et me emphasize that I share your concerns regarding this issue. Because of the potential health and safety implications, the NRC views the control of spent nuclear fuel to be of great importance. At this point, it is highly likely that the two missing fuel rods are either still located in the Millstone 1 spent fuel pool or are buried at a licensed radioactive waste disposal site, thereby posing little or no threat to public health and safety. However, the NRC will closely monitor and evaluate the licensee's response to this event to assess actions to be taken to preclude future similar events. If the missing fuel rods are buried at a low-level waste disposal site, we will assess what corrective actions may be required."

It is my understanding that the licensee has now completed its investigation into this matter, and submitted a copy of its report to the Commission in September (see "Millstone Unit 1: Fuel Rod Accountability Project Final Report" or "FRAP Report"). In the FRAP Report, the consultants hired by Northeast Utilities reported that "the investigation did not yield clear and convincing evidence of the precise location of the two fuel rods." The FRAP Report further concluded that:

> "Specifically, the investigation has determined that the rods are: (a) in an undetermined location in the Unit 1 spent fuel pool; (b) at GE's Vallecitos [CA] nuclear fuel facility; or (c) at one or both of the low-level radioactive waste ("LLRW") disposal facilities in Barnwell, South Carolina ("Barnwell") or the Hanford Reservation in Richland, Washington ("Hanford")."

In other words, the contractor spent $9 million and concluded that it cannot find the two missing fuel rods. I understand that subsequent to the submission of the FRAP report, NRC dispatched investigative staff to Millstone to continue its review of this matter. I would like to know what specific actions are going to be taken by the Commission as a result of the information provided by

the licensee and the investigations of its staff. While it may well turn out that the spent fuel rods were not stolen or diverted, in light of the recent press reports about terrorist efforts to obtain nuclear materials it seems prudent to take every reasonable effort to account for the whereabouts of the rods.

In addition, I recently have been made aware of a report by the Department of Energy's Inspector General, which raises broader questions about the nature and adequacy of controls on nuclear materials by NRC licensees. The findings raised in this report would seem to suggest that the problems identified as a result of the Millstone incident may not be an isolated incident, but evidence of a more generic breakdown in nuclear materials accounting and controls.

In order to more fully understand the Commission's response to the Millstone case, and the overall nature and adequacy of current NRC policies and procedures with respect to the protection of nuclear materials from theft or diversion, I request your assistance and cooperation in providing responses to the following questions:

Questions Regarding the Disappearance of Two Spent Fuel Rods from the Millstone Unit 1 Spent Fuel Pool (SFP)

1) Your February 1, 2001 letter stated that in accordance with 10 CFR 70.51(c), "a power reactor licensee is required to establish, maintain and follow written material control and accounting procedures that are sufficient to enable the licensee to account for the special nuclear material (SNM) in its possession." In light of the fact that Northeast Utilities apparently has been unable to account for the whereabouts of these two missing fuel rods for more than 20 years, and only uncovered the loss of these fuel rods during document review carried out in connection with the decommissioning of Unit 1, do you believe that the licensee has complied with this requirement? Why or why not?

2) Your February 1, 2001 letter also states that "in accordance with 10 CFR 70.51(d), a power reactor licensee is required to conduct a physical inventory of all SNM in its possession at intervals not to exceed 12 months." Given the fact that the two fuel rods apparently were not identified as missing in any physical inventory conducted by Northeast Utilities for over 20 years and were not identified as missing until document reviews conducted in connection with the decommissioning of Millstone Unit 1 in 2000, do you believe that Northeast Utilities has complied with this requirement? Why or why not?

3) Your letter states that "in accordance with 10 CFR 70.54(a) and 74.15(a), the licensee must submit a Nuclear Material Transaction Report to the Nuclear Material Management and Safeguards System (NMMSS), operated for both NRC and the Department of Energy, every time its facility transfers (or

receives) SNM." Given the fact that the FRAP report's review suggests that the fuel rods may have been transferred to facilities in California, Washington, or South Carolina, do you believe that the Northeast Utilities' reporting of transfers of SNM have been compliant with this regulation? Why or why not?

4) Your letter also states that "in accordance with 10 CFR 70.53(a)(1) and 74.13(a)(1), "at least twice a year, the licensee must submit material balance reports concerning SNM received, produced, possessed, transferred, consumed, disposed of, or lost, and an inventory compensation report to NMMSS." Given the fact that these two fuel rods were unaccounted for 20 years and have still not been found, do you believe that Northeast Utilities has complied with this regulation? Why or why not?

5) Your letter also states that there are penalties for transporting of or disposing of materials improperly, based on the circumstances of each case. What penalties have been imposed in this case? What findings preceded those penalties? If no penalties have been imposed, please explain.

6) In your February 1, 2001 letter, you stated that a variety of civil and criminal penalties can be imposed for violations of Commission regulations, including fines of up to $100,000 per day prior to 1986 and fines of up to $110,000 beginning in 1986. If all of the aforementioned applicable regulations cited in your letter of February 1, 2001 were violated by the licensee in this instance, what would be the maximum civil monetary penalty, assuming full application of the $100,000-110,000 per day civil penalty mentioned in your letter?

7) Your letter indicates that violations of NRC regulations are subject to both civil enforcement actions and criminal penalties and that the NRC staff was still investigating this matter. You further indicate that "when complete, we will apply the Enforcement Policy to determine the appropriate enforcement action." Have you made any determination with respect to what enforcement action the NRC plans to take with respect to this matter? If so, what did you decide? If not, when will you complete your determination?

8) Your letter states that "The NRC staff notes...that any civil sanction may be limited by the statute of limitations, 28 USC § 2462, 'Time for commencing proceedings," which is applicable to the NRC as well as other government agencies." As you know, this statute provides that "Except as otherwise provided by Act of Congress, an action, suit or proceeding for the enforcement of any civil fine, penalty, or forfeiture, pecuniary or otherwise, shall not be entertained unless commenced within five years from the date when the claim first accrued if, within the same period, the offender or the property is found within the United States in order that proper service may be made thereon."

a) In the case of violations which were not revealed to the Commission for twenty years, when does the government's claim "first accrue" – on the date the violation first occurred or the date when it was first reported to or discovered by the Commission? In your response, please provide the appropriate citations of the case law relating to this specific matter.
b) If the licensee's violations continued over a period of 20 years (since they failed to report the missing materials despite regular reporting requirements), how does this affect the applicable statute of limitations?
c) Does the Commission believe that a lengthier statute of limitations might be needed to be added to the Atomic Energy Act, inasmuch as 28USC § 2462 explicitly provides that such a longer statute shall apply if Congress has chosen to enact one? If not, can't a licensee simply avoid the imposition of civil penalties by concealing or failing to reveal a violation for five years?

9) In your February 1, 2001 letter, you stated that "following the completion of the NRC's inquiry [into the Millstone matter], we will consider whether industry-wide generic action is warranted." In light of what you now know, and in light of both the events of September 11th and the International Atomic Energy Agency's recent warning regarding heightened risks of theft or diversion of radioactive materials, do you believe that industry-wide generic action is warranted to assure that other licensees review its inventories of nuclear materials to determine if other discrepancies exist? Why or why not?

10) In your February 1, 2001 letter, you say "The NRC staff is still investigating why the Millstone 1 anomaly was not identified in 1980 or in later years by the licensee or NMMS. Based on the results of our investigation, we may elect to require additional actions at other facilities."
a) Has the NRC staff reached any conclusions regarding why the two missing fuel rods were not discovered by the licensee or NMMS? If so, what did you conclude? If not, when will you complete consideration of this matter?
b) Was this just an isolated incident, or evidence of a more widespread phenomenon?
c) If the NMMS was unable to identify shipper-receiver differences or inventory differences in this case, does that suggest fundamental problems with the Nuclear Material Accounting Database? If so, what changes will you propose to correct these deficiencies.
d) Have you elected to require any additional actions at other facilities as a result of your investigations? If so, please describe them. If not, why not?

11) An October 5, 2001 NRC press release reports that "The Nuclear Regulatory Commission staff is sending a team to Millstone Unit 1 to evaluate the comprehensiveness of Northeast Utilities' investigation into the circumstances surrounding the loss of two fuel rods. The NRC team will arrive at the

Millstone plant, in Waterford, Conn., on Tuesday. The four-member team will spend about two weeks on site and also will evaluate the company's root cause analysis." The press release indicates that an inspection report will be submitted within 30 days of the completion of the inspection. Please provide me with a copy of this report.

12) In your February 1, 2001 letter you indicated that both the Richland, Washington and Barnwell, South Carolina facilities "could retrieve waste, if necessary, because of the existence of records for the location of specific disposals." You also indicated that "because the fuel rods remain highly radioactive longer than low-level radioactive waste, there is a potential for higher doses to possible intruders after the Part 61 controls [which rely on 100 years of active institutional controls, government land ownership, and engineered barriers] are no longer in effect."
   a) If you determine that the spent fuel rods may be located at the South Carolina or Washington sides, will you order retrieval of these materials? If so, how will this be done? If not, why not?
   b) Why don't the records at Washington and South Carolina clearly indicate whether or not the fuel rods were disposed of there? Doesn't this indicate a more widespread problem with the record-keeping system? If so, what will you do to ensure that the problem is corrected? If not, why not?
   c) If retrieval of the materials is not undertaken, will you extend the Part 61 controls beyond the 100-year period currently in the regulations in order to protect against exposure to possible intruders? If such controls are not extended, isn't there a potential threat to public health, safety and the environment?
   d) You said in your letter that another potential hazard would be potential migration of radionuclides into the groundwater that would eventually expose members of the public to radiation. You also said that the severity of the hazard would depend on factors such as the specific radionuclides in the waste and site specific characteristics, such as how fast the groundwater moves. What is the nature of the hazard, based on the amounts of plutonium and uranium in the two spent fuel rods and the movement of groundwater at the South Carolina and Richland sites?

13) In your February 1, 2001 letter, you said that it is unlikely that the two spent fuel rods were stolen, because "The very high radiation level of the material makes theft difficult, dangerous, and very unlikely" and "amount and chemical form of the fissile material contained in the two spent fuel rods make it unlikely, in our judgement, that the rods could be used to assist in the manufacture of a weapon." The FARC report reached similar conclusions. However, the September 11th terror attacks have demonstrated that terrorists may be willing to commit suicide in order to cause harm to America, and may be willing to devote many years to the planning and execution of such an attack.

a) In light of the events of September 11th, have you re-evaluated the possibility that the fuel rods may have been stolen or diverted?
b) Isn't it possible that rather than trying to use the fissile material from these weapons for a nuclear explosive device or weapon, terrorists might want to use it for a crude radiological weapon, or "dirty bomb" aimed at dispersing radioactive materials in a populated area?
c) What would be the worst-case public health, safety, and environmental consequences of detonation of a "dirty bomb" fabricated from the two Millstone spent fuel rods?

Questions on the October 26 2001, U.S. DOE Inspector General Report on Accounting for Government-Owned Nuclear Materials Provided to Non-Department Domestic Facilities

The October 26, 2001 report found that DOE inventories indicated that "significant quantities of Government-owned special nuclear material were held by at least two NRC licensees despite the fact that the facilities no longer existed." In the first instance, the special nuclear material involved was a significant quantity of plutonium that was reported to be stored at an NRC facility as of September 2000, even though the NRC did not believe it had held plutonium since 1996. In the second instance, DOE records indicated that a significant quantity of Government-owned plutonium was held at a plant whose license NRC terminated in 1993 and at which no materials were known to be stored. According to the report, NRC officials were unable to explain the discrepancies.

1) In each of these cases, what has the NRC done to resolve the discrepancy?

2) Has the NRC been able to account for the whereabouts of these materials and arrange for their proper disposal? Is NRC certain that the materials are in the possession of individuals who are authorized to possess them?

3) If the NRC has not yet located the materials, what steps will be taken to locate and properly dispose of them?

4) What actions has the NRC taken, and what actions will the NRC take in the future, to ensure that this does not happen again?

The report also documented an instance in which the NRC retrieved a plutonium/beryllium source from an unsecured area of a high school that was no longer licensed to hold the material. The material had been provided to the school in the 1960s but was unaware of its existence until NRC retrieved it in 1989. Apparently, sealed sources such as this used to be tracked and monitored via an ad-hoc system called the "Sealed Source Registry," the use of which was discontinued in 1984 at the direction of the NRC.

5) Why did the NRC direct the use of the Sealed Source Registry to be discontinued?

6) What steps is the NRC taking to ensure that tracking of such materials is resumed and that improperly stored materials are properly disposed of, especially in light of the events of September 11 and reports that terrorists are actively seeking radioactive materials for use in improvised radiological dispersion devices? If no steps are being taken, please fully justify.

7) A recommendation made in the report is that a "comprehensive confirmation of all balances of Government-owned nuclear materials held by domestic licensees" be conducted and that DOE and NRC jointly ensure that future periodic confirmations occur regularly. Does the NRC agree with this recommendation? Why or why not? Has the NRC allocated sufficient resources to ensure that this recommendation can be carried out quickly? Why or why not?

8) Another recommendation made in the report is that "enhanced procedures for the accounting of Government-owned materials" be jointly developed and implemented by DOE and the NRC. Does the NRC agree with this recommendation? Why or why not? Has the NRC allocated sufficient resources to ensure that this recommendation can be carried out quickly? Why or why not?

9) Does the NRC agree that a similar system should be created to track non-Government-owned materials? Why or why not? Does the NRC agree with this recommendation? Why or why not? Has the NRC allocated sufficient resources to ensure that this recommendation can be carried out quickly? Why or why not?

Questions Regarding Risk of Terrorist Attacks Involving Radioactive Sources

I have been informed that approximately 2 million radioactive sources may have been distributed in the United States (excluding very low level sources such as those used in some smoke detectors). These sources are used in a wide array of applications, including medicine, research, and various industrial processes or other commercial uses. While some estimate that about 500,000 of these are no longer needed, they have not been disposed of, and each year the NRC is said to receive approximately 375 reports of lost, stolen or abandoned radioactive sources – a figure that may understate the actual numbers since many lost or stolen items may never be reported. While the radioisotopes used for such applications may not be usable to produce a nuclear explosive device, there is a potential for them to be used to fashion a crude radiological device or

"dirty bomb." I am concerned that such a device could be used to contaminate critical infrastructure, disrupt our nation's financial markets or impede normal economic activity, or paralyze government functions.

1) How many radioactive sources (excluding smoke detectors) are currently licensed by the Commission in the United States? Please provide a breakdown of the types of sources and categories of users of such sources (e.g., research, medical, industrial, commercial, etc.).
2) The NRC's web site reports on several instances of companies being fined for failures to properly control radioactive sources since August of this year, including sources containing americium-241, cesium-137, and iridium-192. According to the press releases on the web site, these sources were either lost, stolen, or improperly disposed of. I have been informed that each year, the NRC receives approximately 375 reports of lost, stolen, or abandoned radioactive sources. Is this true?
3) For the past five years, please indicate a) how many reports of lost, stolen or abandoned radioactive sources NRC received, b) in how many of those cases were the materials recovered, c) the total amount of each radioisotope that has been reported missing and not yet recovered, along with the half-life of each radioisotope, and d) in how many of the reported cases was the responsible party fined, listing the responsible party and the amount of the fine for each such case.
4) A security expert recently suggested to me that a radioactive source as small as 1 curie could be effectively used as a terrorist weapon. Is this true? What would be the worst-case public health, safety and environmental consequences if a terrorist acquired a 1-curie source and detonated it in a crude "dirty bomb" in a populated area? What if the terrorist milled the source into fine particles (e.g., 1-micron average diameter) and detonated it in a populated area?
5) In the aftermath of the September 11th attacks, is the Commission at all concerned about the potential for radiological sources to be used as a weapon by a terrorist organization? If not, why not?
6) Is the Commission satisfied that existing measures are adequate to protect and secure radioactive sources from theft or diversion? If not, please explain what specific measures the Commission is considering to better protect and secure radioactive sources from theft or diversion. If so, why is it that so many sources cannot be accounted for?
7) What measures exist to assure that radioactive sources that are no longer needed are properly disposed of?
8) Many industrial processes (such as fluid level sensing and others) utilize radioactive sources. In the past, using radioactive sources may have been the most technologically advanced and/or economic means of accomplishing the task in question. However, advances in optics and other technologies may provide other, equally cost-effective options. Given the numerous reports of missing radioactive materials, as well as the danger these materials

pose, what does the NRC do to ensure that those seeking licenses to use radioactive materials for industrial processes actually need them and have no other cost-effective alternatives? If no actions are currently being taken to ensure that these materials are not needlessly disseminated, why not?

Thank you for your assistance and cooperation in responding to this request. Should you have any questions about this inquiry, please have your staff contact Mr. Jeffrey S. Duncan or Dr. Michal I. Freedhoff of my staff at 202-225-2836.

Sincerely,

Ed Markey

Edward J. Markey
Member of Congress