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**Date:** Tue, Feb 13, 2001 1:52 PM  
**Subject:** Millstone Q&A

Attached is the Q&A we discussed this morning.

<<Qs for Q-N-A on missing fuel rods.doc>>

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**Washington Department of Health**  
**Questions and Answers on the Missing Fuel Rods**  
**From Millstone in Connecticut.**  
**February 14, 2001**

**Introduction** Recently, the U.S. Nuclear Regulatory Commission (NRC) notified us that during a verification of the spent nuclear fuel records at the Millstone Unit 1 nuclear power plant in Connecticut, it was concluded that the location of two full-length irradiated uranium-filled fuel rods could not be determined. The rods were not properly tracked in the Special Nuclear Material (SNM) records. The records verification is part of ongoing decommissioning activities. One possibility is that the fuel rods are in the fuel storage pool but have not been found yet, and another is that they were shipped offsite to another pool, or possibly mistakenly shipped to one of the low-level radioactive waste disposal sites. The investigation is ongoing and may take two to three months to complete. The missing fuel rods are among approximately 150,000 being stored at the fuel pool at the site.

Besides reviewing shipping manifests and receipt logs, the state is staying in communication with the NRC and the plant operator, has had a conference call with both parties, and has requested and been granted approval to be included in their weekly conference calls. At this point, the state is awaiting the outcome of the investigation before taking any further action. If the fuel rods had been shipped to Washington State, they would not present a short-term risk.

**Question:** How certain is it that the fuel rods are not still at the Millstone site?

**Answer:** Representatives from the utility have stated that the probability that the fuel rods are still in the spent fuel pool is equal to, if not greater than, the probability that they were shipped to another licensed facility.

**Question:** Have receipt logs from the LLRW disposal site been checked for receipt of these rods?

**Answer:** The department has reviewed its receipt logs for shipments from the utility and has asked the operator of the LLRW site to also review its records. The reviews have shown that there were some shipments from Northeast Utilities (NU) that could have mistakenly contained the fuel rods. It should be noted that none of the reviewed manifests list fuel rods as a part of any of the waste packages. The manifests only list reactor components: control rod blades, beam bolts, low power range monitors, velocity limiters, control rod handles, and poison curtain handles.

**Question:** Is it possible that the fuel rods could have been sent from the Millstone site to Washington without the shipment being logged at either end of the trek?

**Answer:** It is not impossible that the fuel rods could have been inadvertently packaged and shipped to the disposal site without being documented in the shipping manifest. According to a statement from an NU representative, the two fuel rods might have

been moved to a different location in the spent fuel storage pool, and the change not properly recorded. In other words, the rods could well be still in the spent fuel pool. Because of the early nature of its search efforts, however, NU cannot currently exclude the possibility that they could have been shipped offsite to another fuel storage pool, or that they could have been accidentally shipped offsite to one of the LLRW disposal sites.

**Question:** Has Washington been contacted by Millstone or federal regulators to look for the missing fuel rods at Hanford (or area storage facilities)?

**Answer:** Neither the U.S. Nuclear Regulatory Commission (NRC) nor the Northeast Utilities/Millstone have requested that the state begin looking for the unaccounted for fuel rods. The NRC has provided periodic updates on the status of the NU investigation, and a conference call was recently held between NRC, NU, and WDOH to discuss this issue.

**Question:** Is there any danger to people due to these fuel rods?

**Answer:** According to federal and NU officials, there is no information or data that suggest there would be an undue risk to the health and safety of the public, plant workers, or workers at the LLRW site. An assessment of the contact radiation levels of the two fuel rods has determined that in the early 1980's, radiation levels would have been approximately 1,600 R/hr, which would have decayed to approximately 850 R/hr today. At such levels, the only way the fuel rods could have been removed from NU without tripping plant alarms, would be inside a shielded cask approved by the NRC for transportation. According to NU officials, the only facilities it could have gone to are an offsite fuel storage facility or the LLRW disposal sites in Washington State or South Carolina. Due to the strict controls in place at these facilities for shipment, receipt, and handling, there would be no undue threat to the health and safety of the public or workers.

**Question:** Do these kinds of fuel rods have any value to terrorists? Could the fuel rods have come into the wrong hands?

**Answer:** No.

**Question:** If these fuel rods were shipped to a LLRW facility, would they have been inside protective containers? Is there a chance that they have been removed from the containers? If that happened, how bad would the health risk be?

**Answer:** The fuel rods would have been placed inside stainless steel containers, and shipped in casks. If they were shipped to one of the commercial LLRW facilities, the stainless steel inner package would have been remotely removed from the shipping cask and placed in a designated disposal cell intact. There would have been no handling of the waste inside the stainless steel container.

**Question:** How would the radioactivity of the fuel rods compare to material already at the disposal site?

**Answer:** The total activity and volume associated with the fuel rods is a small fraction of the total activity and volume already at the site. For example, the fuel rods each contain approximately 300 curies of radioactive material, and the Trojan reactor vessel contained over 1.5 million curies.

**Question:** How is it possible that such a highly regulated, monitored industry could lose these fuel rods?

**Answer:** At this point in NU's search efforts, NU has not uncovered any evidence to suggest that the rods were shipped offsite. Based upon the efforts to date, NU believes that there is an equal probability that the fuel rods remain in the spent fuel pool. NU cannot currently exclude the possibility, however, that the fuel rods could have been mistaken for detectors that are used in the reactor core. The detectors, which are used to monitor power levels in the reactor, are similar in appearance to fuel rods, and can be shipped to LLRW disposal facilities.

**Question:** If the fuel rods are found in Washington, what will the state Department of Health – or other state authorities – do about it?

**Answer:** If the fuel rods are determined to have been sent to Washington, WDOH would need to evaluate the short and long-term risk associated with exhumation, versus that of leaving them in place. A policy decision would then have to be made.

**Question:** What checks and balances are in place in Washington to prevent this kind of thing?

**Answer:** The majority of shipments received at the site are visually inspected; however, shipments with high radiation readings such as the fuel rods in question cannot safely be inspected, so we rely on the generator to provide accurate information on the shipping manifests. The NRC is the regulatory authority for all power plants, and oversees their waste shipments.

**Question:** Does Washington verify the source of fuel rod shipments, so this could be tracked if the fuel rods did come to this state?

**Answer:** Since fuel rods are not allowed at the Washington LLRW disposal facility, we do not perform fuel rod verification, but rely on the utility and the NRC to ensure that none are shipped here. However, the department does require the disposal site operator to keep track of the burial location of all high radiation packages such as those shipped in casks.

**Question:** Is there any chance that the missing fuel rods were sent to Washington and are now lying around some storage facility yard unaccounted for?

**Answer:** Because of their radiation levels, it is highly unlikely that the missing fuel rods – if shipped to Washington – are lying around in a storage facility yard in

Washington, unaccounted for. Due to the radiation levels of the fuel rods, once they were removed from the spent fuel pool, the use of a shielded cask would have been required. Any other movement of the rods from the site would have been immediately detected by radiation monitoring systems.

**Question:** What is the state doing about this problem?

**Answer:** Besides reviewing all applicable files, the state is staying in communication with the NRC, has had a conference call with the NRC and NU, and has requested and been granted approval to be included in the weekly conference calls between NU and NRC. At this point, the state is awaiting the outcome of NU's investigation, before taking any further action.