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Prepared Remarks by Kevin Kamps, Beyond Nuclear, re: proposed highly radioactive liquid waste shipments

Thank you. My name is Kevin Kamps. I serve as Radioactive Waste Watchdog at Beyond Nuclear based in Takoma Park, MD.

Solid high-level radioactive waste shipments raise Mobile Chernobyl risks of crashes, crushing loads, fires, explosions, piercings, and submersions, which could release disastrous amounts of hazardous radioactivity into population centers or drinking water supplies. But these unprecedented *liquid* highly radioactive waste truck shipments we are opposing today represent Mobile Chernobyls on steroids. They are unprecedented, unnecessary, and unacceptably high-risk.

We need to avoid highly radioactive waste wrecks, both figurative – of policy – as well as literal, on our roads, and passing over or next to our fresh water drinking water supplies. We need to just say no to this unwise, high-risk, highly radioactive liquid waste truck transport scheme. The proposal has a lot more to do with generating funds to provide life support for the U.S. Department of Energy’s reprocessing infrastructure, than it does with nonproliferation, or protecting health, safety, and the environment.

Transporting highly radioactive liquid waste is unprecedented in North American history. Trucking it through multiple states would represent 150 games of high-risk radioactive Russian roulette on our roads.

Let’s focus on one of the Mobile Chernobyl and Fukushima Freeway risks: long-lasting, high-temperature fires. The U.S. National Academy of Science acknowledged this as a significant risk in 2006 regarding solid irradiated nuclear fuel. A long duration,

high temperature fire could breach the shipping container and release disastrous amounts of hazardous radioactivity into heavily populated areas or major drinking water supplies. In fact, up to 100% of the highly volatile radioactive Cs-137, a human muscle-seeker, could escape in such a fire, to fallout downwind over vast areas.

Incredibly, the design criteria for Nuclear Regulatory Commission certified Type B packages that would be used in this shipping campaign only require the container to survive a 1,475 degree Fahrenheit (that's 800 degrees Celsius) fire lasting 30 minutes. Diesel fuel, which could easily be involved in a highway crash (it's what semi trucks run on), burns hotter, at 1,800 degrees F (980 degrees C). And real world highway fires have taken way longer than 30 minutes to put out.

As Drs. Gordon Edwards and Marvin Resnikoff have calculated, the highly radioactive liquid wastes in the proposed shipments contain a concentration of radioactive cesium-137 four times greater than the infamous high-level radioactive liquid wastes at Hanford Nuclear Reservation in Washington State. Even a small fraction of the cargo of just one of these 150 proposed truck shipments of highly radioactive liquid waste, escaping into the environment in a crash or fire, would spell unprecedented radioactive disaster for a population center. A spill into Lake Ontario could ruin the drinking water supply for nine million people in the U.S., Canada, and a large number of Native American First Nations downstream.

Even a spill of the highly radioactive liquid wastes would be difficult or impossible to contain. U.S. Representative Brian Higgins of Buffalo and Niagara, NY, has pointed out, in a letter to Energy Secretary Ernest Moniz, that "shipping liquid nuclear waste is far more complicated" than shipping solid irradiated nuclear fuel. He has

pointed out that “its liquid form could make containment in the event of a spill or other adverse event nearly impossible.”

Even a relatively small amount of highly radioactive material, released in an urban setting, could result in unimaginable economic damage and clean up costs, as well as significant damage to human health. A 2007 study by Cousins and Reichmuth, sponsored by Defence Research and Development Canada, about a radiological dispersal device (RDD) or “dirty bomb” open air attack at the CN Tower in downtown Toronto, provides valuable perspective.* The study assumes a “mere” 37 TBq (Tera-Becquerels; a Tera-Becquerel is one trillion Becquerels; a Becquerel is one radioactive disintegration per second) release from the RDD/dirty bomb attack, yet calculates that from a cleanup standard of 500 milli-rem per year, “the estimated economic impact would be \$28 billion, whereas for a cleanup standard of 15 mrem per year the impact would be \$250 billion.” It should be noted that a 500 mrem/year “clean up standard” would pose quite significant risks for human health for persons inhabiting such a contaminated area; a 15 mrem/year “clean up standard” would itself still pose increased risk to human health.

The CNSC reports the concentration of cesium-137 in the HEUNL liquid (highly radioactive liquid waste) to be 70 thousand million becquerels per liter. That is, more than 70 billion Bq per liter. The DOE’s Nov. 2015 SA (Supplement Analysis) reveals that up to 232.4 liters of highly radioactive liquid waste could travel on each truck shipment. This works out to 16.27 TBq per truck shipment, just under half the 37 TBq figure cited in the Defence Research and Development Canada study above. Even a \$14 billion to \$125 billion clean up bill for one of these truck shipments releasing its contents would be

catastrophic for the economy and human health, downwind and downstream, over a broad region.

Such releases of hazardous radioactivity, rather than dilute in the environment, actually bio-concentrate up the food chain. And humans are at the top of the food chain, and would be exposed to the worst of these bio-concentrated radiation doses.

What U.S. states are targeted for these 150 highly radioactive liquid waste truck shipments? A U.S. Nuclear Regulatory Commission *OFFICE OF NUCLEAR SECURITY AND INCIDENT RESPONSE/DIVISION OF SECURITY POLICY DETAILED HIGHWAY ROUTE PLAN*, dated MAY 2013, shows the most likely route as the BUFFALO, NY, PORT OF ENTRY; then passing through Pittsburgh, PA; WV; Roanoke, VA; and Charlotte, NC; en route TO SAVANNAH RIVER SITE, AIKEN, SC. The route is referred to as NRC ROUTE NO. 231.

However, DOE has stated that routing could be varied for security reasons. Charlotte, NC has a population of 2.3 million, while Asheville, NC has a population of 500,000. To avoid such a densely populated city as Charlotte, DOE and its shipping contractor could well decide to go through lesser-populated cities such as Asheville.

Intentional terrorist attacks are another way a catastrophic breach and fire could happen. In fact, a 1998 U.S. Army Aberdeen Proving Ground test with a TOW anti-tank missile showed clearly that a shipping container of equal or better quality to a NAC LWT (Nuclear Assurance Corporation Legal Weight Truck) cask was easily breached by this weapon system designed to pierce thick tank armor. Many thousands of such weapons are available on the international black market. ISIS recently seized hundreds of such weapons in Syria.

NAC has many skeletons in its closet. I'd be happy to share a backgrounder I wrote in 2002 [here is the link: <http://www.nirs.org/radwaste/hlwtransport/accidentshistorybrochure.pdf>] , based on Dr. Marvin Resnikoff's 1983 book "The Next Nuclear Gamble." In 1980 at San Onofre nuclear plant in California, a contaminated NAC cask unleashed a flow of highly radioactively contaminated water measuring 100 to 300 Rem/hour onto the ground. Such highly radioactive liquid can cause severe radiation injury even in a very short period of time. The incident resulted in a large fine by NRC.

In a separate series of incidents, multiple NAC casks bowed out of shaped, diminishing their crash-worthiness.

Last autumn, a NAC LWT cask caddy of the same design as would be used in this campaign suffered a failure resulting in solid HLRW (high-level radioactive waste, irradiated nuclear fuel) crashing to the floor of a wet storage pool at Chalk River. Defective welding by unqualified welders was to blame. This raises very serious concerns about the QA/QC (quality assurance and quality control) of the welding, design, and fabrication of the NAC LWT casks that would be used to ship this highly radioactive liquid waste from Chalk River as well.

* Here is the full citation: Tom Cousins and Barbara Reichmuth, "Preliminary Analysis of the Economic Impact of Selected RDD Events in Canada," presentation at the CRTI Summer Symposium 2007, Gatineau, Quebec, 11 – 14 June 2007. CRTI is the CBRNE Research and Technology Initiative, a program of Defence Research and Development

Canada. The conference proceedings (available from CRTI) list the presentation as CRTI 05-0043RD, entitled “Economic Impact of Radiological Terrorist Events.”