10 CFR Part 71
81 FR 83171

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As of: 1/23/17 9:36 AM
Received: January 20, 2017
Status: Pending_Post
Tracking No. 1k1-8ua2-gvbd
Comments Due: January 20, 2017
Submission Type: Web

PUBLIC SUBMISSION

Docket: NRC-2016-0179
Revisions to Transportation Safety Requirements and Compatibility with International Atomic Energy Agency Transportation Requirements

Comment On: NRC-2016-0179-0005
Revisions to Transportation Safety Requirements and Compatibility with International Atomic Energy Agency Transportation Standards; Notice of Issues Paper, Public Meeting, and Request for Comment

Document: NRC-2016-0179-DRAFT-0045
Comment on FR Doc # 2016-27944

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General Comment

6. Regarding barge shipments of irradiated nuclear fuel on surface waters in the U.S., many such surface waters have been so targeted as routes. From the Feb. 2002 DOE Final Environmental Impact Statement for the proposed radioactive waste dump targeted at Yucca Mountain, Nevada, we learned that the following surface waters across the U.S. were under consideration for such barge shipments: Maryland's Chesapeake Bay; Virginia's James River; Delaware's Delaware Bay; surface waters surrounding New York City, in New Jersey, New York State, and Connecticut, including the Hudson River, the Connecticut River, and Long Island Sound; Massachusetts's Cape Cod Bay, Massachusetts Bay, and Boston Harbor; Lake Michigan, bordered by Illinois, Michigan, and Wisconsin; the Mississippi River through Louisiana and Mississippi; the Tennessee River through Tennessee and Alabama; the Missouri River through Nebraska, Kansas, and Missouri; the Pacific Ocean along the California coast; and Florida's Atlantic Ocean coastline.

But shipments to a so-called centralized interim storage site (or de facto permanent parking lot dump) could likewise require barge shipments on surface waters, at the 26 reactors across the U.S. that lack direct rail access. DOE has indicated it prefers mostly rail shipments. But the only alternative to barges would be heavy-haul trucks, which raise their own sets of complications and risks.

"Accidents" happen, when such gambles, or calculated risks, are undertaken. But what if high-level radioactive waste is involved? U.S. Nuclear Regulatory Commission (NRC) design criteria for atomic waste transport containers are woefully inadequate. Rather than full-scale physical safety testing, scale model tests and computer simulations are all that is required. The underwater immersion design criteria are meant to "test" (on paper, at least) the integrity of a slightly damaged container submerged under 3 feet of water for 8 hours. An undamaged cask is "tested" (on computers, at least) for a 1 hour submersion under 656 feet of water.

But if a cask were accidentally immersed under water, or sunk by terrorists, is it reasonable for NRC to assume that the cask would only be slightly damaged, or not damaged at all? Given that barge casks could weigh well over 100 tons (even up to 140 tons), how can NRC assume that they could be recovered from underwater within 1 hour, or even within 8 hours? Special cranes capable of lifting such heavy loads would have to be located, brought in, and set up. And what about the fact that Lake Michigan is deeper than 656 feet at locations not far from DOE's proposed barge shipment routes? Oceanic barge shipments also raise the specter of such deep-water sinkings.

The dangers of nuclear waste cask submersion underwater are two fold. First, radioactivity could leak from the cask into the water. Each container would hold 200 times the long lasting radioactivity released by the Hiroshima atomic bomb. Given high-level atomic waste's deadliness, leakage of even a fraction of a cask's contents could spell unprecedented catastrophe in the source of drinking water countless numbers of people, considering fresh water surface waters like the Great Lakes, and rivers; leaks into seas or tidal rivers could ruin fisheries. Just being designed a radioactive waste barge route would decrease property values; an accident involving a waste barge all the more so; and even worse, if radioactivity is released into the environment.

Second, enough fissile uranium-235 and plutonium is present in high-level atomic waste that water, with its neutron moderating properties, could actually cause a nuclear chain reaction to take place within the cask. Such an inadvertent criticality event in Sept. 1999 at a nuclear fuel factory in Japan led to the deaths of two workers; many hundreds of nearby residents, including children, received radiation doses well above safety standards. It was the worst nuclear power disaster in Japanese history, until the Fukushima nuclear catastrophe.

An inadvertent criticality would make emergency response a potentially suicidal mission. It would likely worsen the radioactivity releases to the surface water body, as well.

Both NRC and IAEA regulations regarding barge transport of irradiated nuclear fuel on surface waters are in need of significant strengthening, given the high risks involved to drinking water, fisheries, property values, tourism, recreation, etc.

As the water protectors at the Standing Rock Sioux Tribe Reservation on the Missouri River in North Dakota say, Mni Wiconi, Water Is Life. We put it at risk, at our own peril.