Talking points: Dry Casks vs Fuel Pools

(wet storage of highly radioactive fuel rods)

The following comments address the 2013 Waste Confidence Generic Environmental Impact Statement, Draft NUREG-2157 pages xxviii, xxix, xlix, 1-12, 1-13, 1-14, 2-12:

1. Dry Cask Advantages over Irradiated Fuel Pools

A. Some irradiated fuel pools in the U.S. currently hold up to 9 times the amount of spent fuel for which they were designed. (Lochbaum)

B. The pools are not protected by redundant emergency makeup and cooling systems or housed within robust containment structures having reinforced concrete walls several feet thick. (Lochbaum)

C. Irradiated fuel casks can withstand environmental disasters that spent fuel pools cannot, as evidenced by the continued function of the dry casks at Fukushima. The casks survived the 9.0 quake and continue to protect the irradiated fuel, even though the tsunami flooded them. These containers have not exploded; are not on fire; are not catastrophically leaking and do not require ongoing addition of liquid to cool. On the face of it, they are out-performing the pools on the site.

D. Dry casks have the advantage of passive cooling via airflow, making them less vulnerable to natural disaster and sabotage.

E. Spent fuel pools are attractive targets for terrorists. (Physicians for Social Responsibility, National Academy of Sciences, 9-11 Commission Report, Alvarez)

F. Dry casks are less promising targets for terrorists because one would have to trigger failure in several casks to accomplish the same amount of radiation release as an attack on a spent fuel pool. Casking spent fuel should be expedited as a national security top priority.

G. Transfer of irradiated fuel to casks should be done sooner rather than later. Since irradiated fuel will have to be put into dry containers to remove it from the reactor site when a repository is available, this process is not an "if" it is a "when." Public health will be protected better if the fuel is transferred now.

H. On-site storage of irradiated fuel rods in dry casks should be made safer and more secure by adoption by NRC of regulations to mandate HOSS (Hardened On-Site Storage). HOSS is a system whereby more space between the containers increases security, and earth mounds or berms form a barrier between the containers and any public-access points such as roads, delivery areas and water-front. HOSS also mandates real-time heat and radiation monitoring and would also provide for local community over-sight of the waste installation such as a citizen advisory board.

H. On the other hand, there is a limit to the at-reactor dry storage concept. Under its "indefinite storage" scenario, NRC has assumed that dry cask storage--cask pads, inner canisters, and the dry casks themselves--will be replaced once every 100 years, indefinitely into the future. NRC assumes that Dry Transfer Systems will be built (and also replaced every 100 years), since pools will have been dismantled during decommissioning by at most 60 years after permanent reactor shutdown. But NRC has not dealt with the very real risk that the irradiated nuclear fuel will so degrade with age that such transfer operations could not be carried out safely or smoothly. This is especially a risk with "high burn-up fuel," that has spent more time in an operating reactor core, and is thus significantly more radioactive and thermally hot. NRC also has not provided the price tag for such future transfer and replacement operations.

I. Casking the spent fuel would prevent much of the hazard associated with transportation of high-level nuclear waste. However, locations where HOSS (Hardened On-Site Storage) is not safe (places vulnerable to flooding, for example), hardened dry cask storage should be done as close to the point of generation as possible. HOSS cannot be a permanent measure on the seacoasts and fresh water sources (rivers, lakes, reservoirs) of our country, due to rising sea levels and risk of leakage into our vital drinking water supplies.

J. Another major appeal of HOSS is that it is currently an interim storage solution endorsed by the bulk of public interest groups concerned with nuclear issues. Over 170 groups in all 50 states have endorsed the concept of HOSS, including most groups near reactor sites. (NIRS)

K. The advantages of dry cask storage over pool storage is further documented by a team of experts on the hazards of spent fuel pools which includes the current chair of the Nuclear Regulatory Commission, Allison Macfarlane.(Alvarez)
L. There is a substantial reduction in the risk to the population if the spent fuel is transferred to casks: "The risk reduction is undeniable: the contaminated land area is reduced from 9,400 square miles to 170 square miles and the number of people displaced from their communities for a long time drops from 4,100,000 to 81,000." (Lochbaum)

NRC GEIS Documents are posted here: http://www.nrc.gov/waste/spent-fuel-storage/wcd/documents.html

1. Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, and Frank N. von Hippel, Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States,*Science and Global Security, 11:1–51, 2003*
http://mothersforpeace.org/data/20030122ReducingTheHazards?searchterm=spent+fuel+pools

2. "Safer Storage of Spent Nuclear Fuel", Union of Concerned Scientists, 2012.
http://www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/safer-storage-of-spent-fuel.html

3. "SAFETY AND SECURITY OF COMMERCIAL SPENT NUCLEAR FUEL STORAGE, Public Report", Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, National Academy of Sciences, Wash. D.C., 2005. http://www.nap.edu/openbook.php?record_id=11263&page=R1

4. Lochbaum, David, Director, Nuclear Safety Project, testimony Before the Senate Committee on Energy and Natural Resources, July 20, 2013.http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=89dbc888-171c-4f77-8ecf-83a0055fcfb9

5. Principles of Safeguarding Nuclear Waste at Reactors or Hardened On-Site Storage (HOSS)
http://www.nirs.org/radwaste/policy/hossprinciples3232010.pdf

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