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SPENT NUCLEAR FUEL FACT SHEET

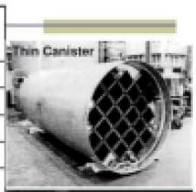
SanOnofreSafety.org 7-11-2018

Spent nuclear fuel and its containment must be retrievable, maintained and monitored in a manner to prevent hydrogen gas explosions in both short and long-term storage and transport. This is not being done. -- *Nuclear Waste Technical Review Board (NWTRB) December 2017 Management and Disposal Of DOE Spent Nuclear Fuel report to Congress.*

- **Thin-wall canisters**, used at most US sites, cannot meet NWTRB requirements.
- **Proposed New Mexico and Texas "interim" storage facilities** do not meet NWTRB requirements. And their plan is to return leaking canisters back to sender.
- **Thick-wall casks** meet NWTRB and 1982 Nuclear Waste Policy Act (NWPA) requirements.
- **Each canister holds roughly a 1986 Chernobyl nuclear disaster** (Cesium-137).

Reasons to require thick casks

Safety Features	Thin canisters	Thick casks
Thick walls	1/2"- 5/8"	10"- 19.75"
Won't crack		√
Ability to repair, replace seals		√
Ability to inspect (inside & out)		√
Monitor system prevents leaks		√
ASME container certification		√
Defense in depth (redundancy)		√
Stored in concrete building		√
Gamma & neutron protection	With concrete overpack	√
Transportable w/o add'l cask		√
Market leader	U.S.	World



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Holtec HI-STORM UMAX has air vents in above ground lid.

- **Holtec lid air vents** circulate radioactive and corrosive air particles around the canisters, into the environment
- **Moist marine salts and other conditions can cause short-term corrosion and cracks in canisters**. A 2-year old Diablo Canyon canister was found to have cracking conditions. Once cracks start, they can grow through the wall in **16 years** (NRC).
- **Potash** (potassium chloride), found in New Mexico, is also highly corrosive.
- **NRC knows licensees** have no method to prevent or stop leaks or explosions in thin-wall canisters yet continues to approve them.
- **Holtec President admits** not feasible to repair, even if you could find cracks. He states even a microscopic through-wall crack will release millions of curies of radionuclides/
- **No drains in Holtec holes** holding canisters. Water and debris must be pumped out through air vents. Canisters are never cleaned.

Areva NUHOMS has air vents in concrete housing.

- **Some thin-wall canisters are already 25 years old** (Calvert Cliffs, MD 1993) and may already have started to crack.
- **None have been inspected for cracks and depth of cracks.** Technology doesn't exist to do this once thin-wall canisters are filled.
- **NRC approves stopping outlet air vent radiation reporting.** This is where radiation levels will be highest with canister leaks.
- **Outlet air vents** are on top of each concrete housing unit. The canisters are stored horizontally inside each concrete housing unit.
- **No method in place to stop leaks or replace failing canisters.**

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Recommendations

Amend the NWPA to require the Nuclear Regulatory Commission (NRC) comply with NWPA safety requirements. Require the NRC develop a high priority plan to implement these requirements for existing and new systems and facilities. The current NWPA safety requirements only apply to the DOE.

Require a high priority project to move existing spent nuclear fuel (SNF) from thin-wall canisters to thick wall casks that meet NWTRB and NWPA safety requirements. Time is of the essence. Cracking canisters and uninspected spent nuclear fuel cannot be safely stored or transported. Require storing casks in hardened buildings for additional environmental and security protection. *Thick casks survived Fukushima and are used internationally*.

If we don't do this right, nothing else matters.

STEP ONE: **Move spent nuclear fuel to safer thick-wall casks that meet NWPA and NWTRB requirements.**

STEP TWO: **Find nearest safest location for spent nuclear fuel away from hazardous areas (e.g., away from flood or sea rise risks). Store thick-wall casks in reinforced building for additional environmental and security protection.**

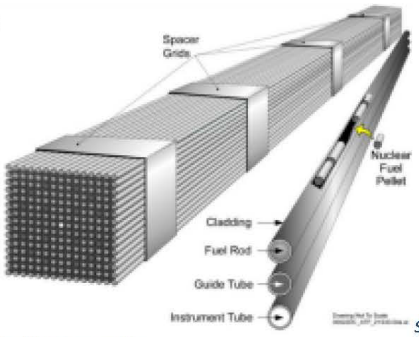
H.R. 3053 Nuclear Waste Policy Amendment Act of 2018 does not meet NWTRB and NWPA critical safety requirements.

Instead, H.R. 3053:

• removes critical spent nuclear fuel storage, transport and environmental safety requirements from NWPA;

• removes oversite, public input and transparency; • preempts or jeopardizes other federal and state rights; • does not require the NRC to meet critical safety requirements; • underfunded and gives total authority to the DOE and the NRC; • does not solve current short-term urgent nuclear waste problems.

(ML14031A323), excluded high burnup fuel from evaluation, yet NRC references this to justify safe transport.



Spent nuclear fuel (SNF) assembly. *SNF rods can become damaged in dry storage and transport. The NRC is still studying whether train vibrations will cause fuel rods to fail. SNF assemblies in dry storage should be inspected before transport. There are currently no plans to do this.*

Transport Issues

• Naval transport safety is not comparable to interim storage transport. Navy uses limited routes and uses different containers and fuel assemblies hardened for military conditions.

• Infrastructure issues unresolved. Rail not designed for heavier (over 150 to 200+ tons) transport casks. Less than 1% of rail system inspected by Federal Railroad Administration (FRA).

• High burnup fuel assemblies can become damaged in dry storage and transport. They must be inspected before transport, but thin-wall canisters are not designed to be opened for inspection. NRC is still studying whether train vibrations will cause fuel rod damage. NRC *NUREG-2125 Spent Fuel Transportation Risk Assessment 2014 Final Report*

• Southern California Edison admitted welded thin-wall canisters cannot be unloaded back into spent fuel pools [an NRC requirement] due to "reflooding" issues. Only other option is a dry fuel handling facility (hot cell).

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Other countries store thick-wall casks in hardened buildings for security & environmental protection.
Japan – thick-wall casks in building at Fukushima Germany – thick-wall casks in building at Gorleben

Survived 2011 Great Earthquake and tsunami Stored for over 40 years without major problems