NUCLEAR SPENT FUEL STORAGE STRATEGY -- HELMS

H — **HARDENED** -- Storage Facility must have design features to resist non-nuclear attacks, such as protected by robust cover, to be used once the spent fuel cools sufficiently. Current spent fuel storage has little or no hardening and most are easy targets to create devastating dirty bomb.

E — **EXTENDED-LIFE** -- Cask system must provide 1,000 year design-life with periodic maintenance and 300 year containment with no active maintenance. Current design-life is 40 years. Proposd Dual-Wall Canisters have an exterior protective shell that can be easily monitored for cracks using helium pressure drop and then easily replaced.

L — **LOCAL** -- Near companion nuclear plant, but AWAY from water resources, dense populations, and seismic zones. Likely within-state. Avoid transporting as much as possible. Nationally, consolidated into perhaps a dozen sites. Definitely not within yards of the ocean like at San Onofre.

M — **MONITORED** -- 7/24 electronic monitoring for cracks and radiation; Leaks in the containment boundary detected using pressure drop in the outer shell rather than currently proposed and rare robotic inspections that have no record for detecting cracks in canisters.

S — **SURFACE STORAGE** -- Spent fuel is far too hot to place in a deep geologic repository, even if we had one open. Yucca Mountain planned for active ventilation for 150 years. It makes no sense to put the spent fuel deep underground if we have to actively ventilate. Monitorable and Retrievable.

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HELMS is a set of criteria which can be used to evaluate options for dealing with nuclear spent fuel and other radioactive waste. Let's face it, our current strategy is a failure, and it is time to create a new one.

Our experiment with nuclear energy has produced two very stark lessons. First, we now know that nuclear energy is far too risky for error-prone humans. Devastating accidents will happen. Secondly, we also know that we have no perfect place to put the waste. Yucca Mountain was planned to be open by 1998. It has been thoroughly studied and not only does it have many technical shortcomings (wrong type of rock, many faults, water intrusion, it isn't really "deep," no rail line) but also spent fuel is far too hot. The YM plan includes active ventilation for 150 years. That effectively leaves the spent fuel on the surface, yet makes it very hard to manage. And, once used, it would be much too hot under ground for humans could work there. So the chant for Yucca Mountain and the notion that it is only a political problem is far from reality. It is simply not a solution for probably the next 150 years or longer.

Essentially then, we are left with SURFACE storage to facilitate passive cooling, monitoring, and management. Surface facilities should be relatively LOCAL because there is no sense in moving this waste all across the country just to leave it on the surface anyway. HELMS storage should be near the sourcing reactor site but away from a) water resources that are typically right next to nuclear plants, b) dense populations, and c) seismic hazard areas. Facilities must be HARDENED against explosive threats and other terrorist threats.

Finally, we need to use far better canisters than the 40-year design life canisters which are being used today. The EXTENDED LIFE criterion promotes a canister design-life goal of 1,000 years (with periodic maintenance) and 300 years of passive safety (if no maintenance is performed at all) to allow for a "technological dark age" where administrative control is lost. We suggest upgrading existing canisters by placing into a secondary and thicker outer shell. The dual-layer approach provides for easier 7/24 MONITORING of any leaks by noticing if the sacrificial outer shell can hold pressure, and the interior canister will not breakdown from corrosion. This proposal provides an upgrade path as existing canisters can be enclosed in the outer shell as soon as they cool down, so as to get industry endorsement.

HELMS has been submitted to the NRC as a formal petition with specific changes requested to Part 72 (which deals with dry storage) to correct a very serious discrepancy in the law. On one hand, we have canisters which were designed for a short, 40-year design life. On the other hand, we have the current "Waste Confidence" report which allows the waste to be stored in dry storage "indefinitely." Guess what, "40 years" does not equal "indefinitely." This is the central logic of our petition. Our petition has appeared in the Federal Register and is open for comment.

The secondary shell allows the interior canister to be repackaged without needing a hot-cell or fuel pool, and it just makes sense. Ever heard of the Exxon Valdez? After that accident in 1989 all tankers were required to have dual wall hull.

PLEASE HELP US PROMOTE **HELMS**, A PRUDENT SOLUTION!
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