

### **Editor's Comment:**

In my opinion it suffers from three severely crippling short-comings:

The notion that radiological waste can be considered non-contaminating simply because it be employed for useful commercial purposes is specious on its face; and

- The assertion that the FBNR module can be considered safe because it represents a variation on current encapsulation means for transport ignores the fact that the operating temperatures inside the module exceed 1600C – there is no likelihood that this means of encapsulation will be approved for transshipment under prevailing nuclear regulatory treaties because in point of fact the capsule itself constitutes a fundamental danger to life and limb; and
- The paper ignores the primary threat to public welfare and safety. Nowhere do the authors engage the issue of neutron embrittlement in their cavalier discussion of the dangers imposed by encapsulating high temperature floating bed nuclear fission reactor elements. The simple fact of the matter is that it is now abundantly clear that no material known to science can withstand the ravages of neutron embrittlement for more than 10 years. The extraordinary rate of containment failure at nuclear waste storage sites such as Savannah River in the United States demonstrates that radioactive daughter products created during the nuclear fission cycle cannot be safely encapsulated using any known material or strategy. This is precisely why the Yucca Mountain initiative failed. It is also why the radioactive waste storage facility located in New Mexico exploded – encapsulation is a non-starter by any reasonable consideration.

Further, it is precisely because there is no accepted method for remediating radioactive emissions generated by spent nuclear fuels. Fuel rods and the structural elements which hold them in place, whether devised of carbon or other materials, remain contaminated for long periods of time. The proliferation of unremediated nuclear waste materials constitutes an existential threat to every living thing on the planet. The fact that the waste material can be exploited for ancillary commercial applications notwithstanding, the authors notion that high level nuclear waste materials can be safely used without due and prudent attention to the dangers they represent is preposterous and unscientific.

While it remains true that decay products are still produced during the fission cycle reactions, it is also accurate to suggest that a properly designed apparatus could be built to operate in isolation for up to 300 years without requiring maintenance or repair. A liquid sodium-thorium reactor cannot achieve self-sustained criticality and therefore does not represent a clear and present danger even in the face of catastrophic natural events such as occurred in Northern Japan in 2011.

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