

From: **Alex Cannara**
Date: Mon, Apr 12, 2010 at 2:11 PM
Subject: Grand Challenges
To:

Thank you for the opportunity to pass this important information in to AAAS and the White House.

I've already sent the attached to the President, DoE, Congress and private universities capable of the R&D work it implies. However, I'm always ready to try, try again! Our kids & grandkids are looking back at us from the future -- what will they think of us then?

We have a unique ability to apply today the energy technology DoD funded decades ago -- a generation technology that worked for some years (1954 to 1974), but was cancelled because it could not be used for Cold War bombs.

<<http://thoriumenergy.blogspot.com/2006/04/brief-history-of-liquid-fluoride.html>>

LFTR is the term for the Liquid Fluoride molten-salt Thermal-neutron Reactor of exactly the type than ran for 4 years at ORNL in the 1960s. Using Thorium Fluoride as the fertile 'fuel' salt allows us to produce thermal energy for turbine generators anywhere in the world or space, and to do it safely, ~30% more efficiently, and without the risks inherent in the Uranium-fueled, BWR/LWR plants now dotting the world. Japan, India & others are using the ideas we developed for this technology. Shall we fall behind on perhaps the most important advance the world can now make?

Senators Hatch & Reid introduced a limited bill to fund solid-fuel R&D including Thorium, but it needs amendment, or a companion bill, to include liquid-salt R&D. I encourage you to refer to the attached letters and...

<http://tinyurl.com/ye27k98>
<http://tinyurl.com/yb2qgex>

The Thorium Energy Alliance is actively working with US and international groups to stimulate development of safe, Thorium-Fluoride MSR (LFTR). But, there will be opposition from the established nuclear industry, because the technology is simple & inexpensive -- no expensive enrichment & solid-fuel pellets, no large-scale mining, no short-lived fuel rods that must be removed/reprocessed after <10% of their fuel has been used, no significant waste, no danger of explosion/meltdown, safe automatic throttling of reaction rate to load, and so on.

In fact, a molten salt reactor (MSR) can consume all current reactor wastes as part of the fluoride fuel. This means we no longer have a waste-storage problem and its concomitant proliferation issues. It means we can site new MSRs in existing, de-commissioned LWR/BWR plants and have one MSR unit devoted to consuming the

spent fuel now stored on site -- the ultimate waste products are <5% in mass and <1/1000 the lifetime of conventional reactor wastes. In addition, many of these simpler 'wastes' are salable, for medical & other purposes.

The LFTR also means that we can save the time & expense of building many new reactor structures, with their high CO2 footprints in concrete. Because an MSR runs at a higher temperature, its thermal efficiency is about 30% better than existing steam cycles, and it's far smaller & cheaper than any LWR/BWR -- there's no need for emergency-cooling systems, no need for high-pressure containment, etc. 3-4 MSRs of 1GW each could inhabit an old, de-commissioned containment shell. Upgrading the turbine generators would then allow one old plant to obviate the need for about 3 new ones, of any type.

And, of course, a new LFTR can be constructed far more cheaply and achieve a density of more than 100MW/acre, allowing in-city construction, which reduces our current, very significant transmission-line losses. I urge you to watch the short video here...

www.thoriumenergyalliance.com/

Now for the most important reason to continue MSR R&D on LFTR -- it solves our worldwide food & water problems. Our population will reach 9 billion by 2050. That's not far away. To feed those 3 billion new folks, we know we need water and land. The land needed is equal to the size of all Brazil -- arable land, with adequate fresh water. No amount of 'biofuel' land consumption can then be tolerated. Our energy sources & distribution must be electric, and the safe, compact LFTR allows desalination & power to be situated anywhere in the world (or Moon,, Mars...) we wish. The amazing reality is that Thorium is essentially a free byproduct of other mining and we already have a stockpile that can supply all US energy needs for several years.

This is the kind of smart technology we need now, because we don't have time to waste. Australia is wisely interested too...

www.cosmosmagazine.com/features/print/348/new-age-nuclear?page=0%2C3

The punch line in all this is that the technology is ours. So, do we really want to lackadaisically give it over to others who'll then sell it worldwide, including back to us?

I'll happily discuss this further with anyone you wish.

Sincerely,

--

Dr. Alexander Cannara
Menlo Park, Calif.