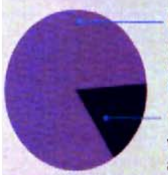
LIQUID-FLUORIDE THORIUM REACTOR

SAFETY FIRST

ENHANCED DISASTER SAFETY

The LFTR is an extremely safe, self regulating reactor design. ***Core meltdown is absolutely not a problem.*** Continuous removal of radioactive gases insure that only small amounts of radioactive gases would be released in an accident. Coolant leaks do not lead to fires or explosions. In the event of a leak, there would be little or no solid fission product release/radiation problems. ***Attacks by terrorists using explosives or aircraft would not create a wide dispersal of radioactive materials*** because of the chemical properties of the liquid salt coolant/fuel.

LFTR WASTE SAFETY



83% of LFTR waste products are safe within ten years*

17% of LFTR waste products are safe within 300 years*

*Compared to 10,000+ years for current reactor waste

ENHANCED EFFICIENCY

In theory, ***LFTRs would produce much less waste than traditional plants*** in all areas along their process chain from thorium ore extraction to waste storage.

A LFTR plant would generate ***4,000 times less mining waste and would generate 1,000 to 10,000 times less nuclear waste*** than traditional reactors.

Because LFTRs burn virtually all of their fuel, the ***83% of the waste products are safe within ten years and the remaining 17% become safe after 300 years*** (compared to 10,000 years or more with current reactor waste).

In addition, LFTRs can actually be used to burn current waste from most of today's nuclear plants.

THORIUM IS...

4x as common as URANIUM &

5,000x as plentiful as GOLD

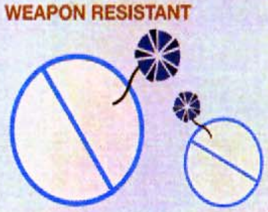
LARGE SUPPLY

Thorium is very abundant. As the 36th most plentiful element in the crust, it is four times as common as uranium, and ***5,000 times as plentiful as gold.***

According the U.S. Geological Survey's 2006 Mineral Yearbook, the ***United States has roughly 300,000 tons of thorium reserves, which accounts for roughly 20% of the world's supply.***

This resource translates into the ***equivalent of nearly 1 trillion barrels of crude oil***, or five times the entire oil reserves of Saudi Arabia.

WEAPON RESISTANT



ENHANCED PROLIFERATION RESISTANCE

LFTRs are seen as weapons proliferation resistant because the 233U (a fissionable material that could be used to build weapons) produced in an LFTR is inevitably contaminated with 232U which needs to be separated from the 233U in order to create bomb-ready material.

232U can not be chemically separated from 233U and has several decay products which emit high energy gamma radiation. These high energy photons are a radiological hazard that necessitate the use of remote handling of separated uranium and aid in the passive detection of such materials.

USING LFTR EXCESS ENERGY

Economical desalinization of water

Separation of hydrogen from water for fuel

Source of rare elements for modern electronics, commercial products and industrial processes

SECONDARY PRODUCTS

Because LFTR's are so energy dense, excess heat and electricity from the reactor can be utilized in areas beyond electricity production:

1. Economical desalinization of water
2. Separation of hydrogen from water or hydrocarbons for fuel
3. Generation of ammonia for fertilizer or fuel cells
4. Extraction of hydrocarbons from oil shale and tar sands
5. As a source of rare elements. *Some of the waste of LFTRs are stable, but rare elements such as rhodium, ruthenium, technetium, cesium, strontium, xenon, and others, are relied on heavily in modern electronics, commercial products and industrial processes.*

LFTRs have no refueling outages and are able to continually refuel and remove waste product.

LFTRs have the ability to satisfy demand, which satisfies today's need for both base load coal or nuclear power and expensive peak load natural gas power.

LFTRs operate at high temperatures with a 50% thermal/electric conversion efficiency, reducing the amount of cooling required by today's nuclear power plants by half.

LFTRs are air cooled, making them feasible for locations with water scarcity issues.

LFTRs have low initial costs because they don't need enormous pressure vessels or containment domes for safety. Additionally they have low cooling requirements.

LFTRs can be factory produced, allowing for lower costs and shorter timetables, enabling efficiency in improving newer models.

this infographic is courtesy of WellHome.com

COMPARING NUCLEAR REACTORS

TYPE OF REACTOR	Uranium-Fueled Light-Water Reactor	Seed-and-Blanket Reactor	Liquid Fluoride Thorium Reactor
FUEL	Uranium fuel rods	Thorium oxide and uranium oxide rods	Thorium and uranium fluoride solution
FUEL INPUT PER GIGAWATT OUTPUT	250 tons raw uranium	4.6 tons raw thorium, 177 tons raw uranium	1 ton raw thorium
ANNUAL FUEL COST FOR 1 GW-REACTOR	$50-60 million	$50-60 million	$10,000 (estimated)
COOLANT	Water	Water	Self-regulating
PROLIFERATION POTENTIAL	Medium	None	None
FOOTPRINT	200,000-300,000 square feet, surrounded by a low-density population zone	200,000-300,000 square feet, surrounded by a low-density population zone	2,000-3,000 square feet, with no need for a buffer zone