

**TESTIMONY BEFORE THE OHIO SENATE
PUBLIC UTILITIES COMMITTEE
HOUSE RESOLUTION 518
December 4, 2015
PROPONENT TESTIMONY OF WILLIAM H. THESLING PH.D.
EXECUTIVE CHAIRMAN
eGENERATION FOUNDATION**

Thank you Chairman Landis and members of the Energy and Natural Resources committee for allowing me testify and speak on behalf of eGeneration Foundation here today.

My Name is William Thesling. I am a co-founder of eGeneration Foundation, a pro-Advanced Nuclear non-profit educational organization, established in 2012. I am here today testifying as a proponent for HR-518.

I have lived in Ohio my entire life. I have a doctorate in Electrical Engineering from Cleveland State University. I am a co-founder of Efficient Channel Coding Inc., a technology company specializing in advanced digital communications products (Satellite, fiber optics and terrestrial wireless). ECC was sold to Viasat, a Nasdaq company, in 2005. I am an author or co-author on over 30 patents.

Thank you for your time and consideration on House Resolution-518. House Resolution-518 is fundamentally a petition to the US Department of Energy (DOE) for “rule making”, to fulfill an aspect of the 1954 Atomic Energy Act to respect States rights and insuring their ability to develop Nuclear Technology.

Research and Development is the life blood of any technology endeavor. While at Efficient Channel Coding Inc., I served as the Chief Technology Officer and saw first hand how competition fosters R&D. Additionally, I also observed how a lack of competition tends to curtail it. We at eGeneration strongly believe that Enabling States to engage in more self-directed research will greatly enhance Nuclear Engineering R&D throughout the country and will bring many new, disruptive technologies to market, greatly enhancing our Standard of Living. House Resolution-518 is a step to making that happen, starting here in Ohio.

House Resolution-518 will help facilitate the creation of new industries in Ohio. These include Medical Isotope production and distribution. Liquid Core Molten Salt Reactors (MSRs) are a recognized “Generation IV” reactor type that have shown great promise in their early development, development that essentially ceased in the early 1970s for largely political reasons. MSRs have some game-changing attributes that makes this

possible. In an MSR, the fuel is dissolved in a liquid of molten salt. The molten salt gets hot, and this heat will be used in many industrial processes. The key characteristics are:

1. The fuel is in a liquid form.
2. The molten salt stays liquid (doesn't boil) at temperatures up to 2500⁰ Fahrenheit
3. It has these properties at atmospheric pressure.

The advantages of these properties are enormous.

The liquid form of the core means that a "meltdown" is, by definition, impossible.

The "higher actinides", the component of nuclear waste that requires 300,000 years of sequestration from the environment, can be kept in the reactor where it will eventually fission and be eliminated. The result is far less nuclear waste (as much as a 99% reduction), that needs to be sequestered for far less time (as little as 300 years).

The liquid form is also a requirement for processing the core material. This allows for the relative ease of extraction of valuable isotopes produced via the Fission Process.

Molybdenum-99 is one such isotope used in technetium generators which produce technetium-99m. This valuable substance is used in 320,000 medical diagnostic procedures in the United States each week. At present there are no domestic supplies of Molybdenum-99. The worldwide supply comes from just six, government subsidized, aging research reactors built in the in Eisenhower-Khrushchev era. None are in North America. These reactors have gone down for unscheduled maintenance in the past, disrupting the availability of this valuable material. Molybdenum-99 decays away and cannot be stored for more than about 1 week.

The potential benefits of Molten Salt reactors to the health care industry goes beyond technetium-99m. As an example, Actinium Pharmaceuticals has shown excellent results with targeted alpha therapy in the treatment of many forms of cancer. A limitation of this therapy is the supply of Actinium-225, a radioisotope produced in thorium based Molten Salt Reactors.

We at eGeneration believe the benefits of advanced MSR technology to the health care industry is an obvious first application, but the long-term benefits goes way past that. Such reactors were originally pursued for their light weight and compact size. This has benefits to:

National Security: The US military would benefit from a light weight portable power source requiring little to no refueling.

Energy Production: Presently, about 18% of our nation's electricity comes from Nuclear power. Smaller, lighter and safer MSRs could easily replace our current fleet of nuclear reactors and extend their portion of electricity production to 100%. The higher temperatures available with MSRs enable applications beyond what is presently done. Consider for example Chemical process powered by MSRs, using Ohio coal as feedstock to make synthetic gasoline! This has the potential to eliminate foreign oil imports and reduce the price of oil in the world market.

The passage of HR-518 signals to the country, and to the federal government, that Ohio is taking a leadership role in the development of new nuclear technology. Ohio's workforce is well suited to support a nuclear renaissance based on Molten Salt Reactors. Such reactors are ideal for production via the Small Modular Reactor Model. SMRs could be produced in an Ohio factory, and shipped via truck or rail to where they would be used, and installed at the site. Such a factory would produce thousands of well paying jobs and put Ohio in the middle of energy production for the 21st century.

These are just a few of the reasons why I strongly encourage the passing of HR-518.

Thank you.