

# Innovative Stationary Molten Salt Fast Reactor (ISMSFR)

Improved method to burn Used Nuclear Fuel (UNF)

Nuclear power has been a valuable energy alternative for decades. Uranium is the main fuel for reactors. Once the Uranium has been through the reactor it is considered as Used Nuclear Fuel (UNF). UNF is highly regulated due to its high radioactivity and is stored in regulated waste pools. An alternative method to removing the nuclear waste is via a fast neutron spectra reactor to burn higher actinide components. Unfortunately, current fast reactor designs have complicated configurations that lead to high manufacturing costs.

## The technology

Researchers at VCU have designed an Innovative Stationary Molten Salt Fast Reactor (ISMSFR). The ISMSFR technology is an improved method based on the state-of-the-art Stable Salt Reactor (SSR). This simplified design is made of a single integral homogeneous reactor core component to reduce complications and manufacturing cost. To improve reactor maintenance, molten salt fuel is restrained within the core portion to eliminate radiative fuel outside the core. The design also operates with an online refueling system to allow gaseous fission products to be removed continuously.

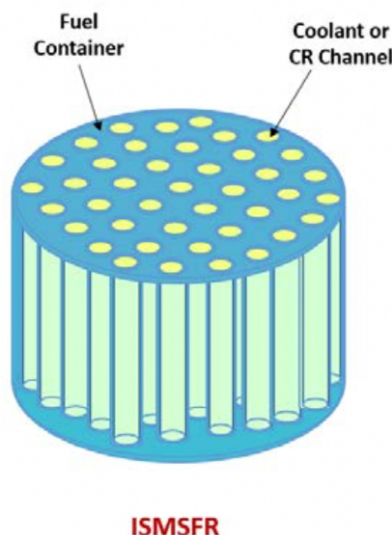


Fig 1. Schematic view of the invented ISMSFR

## Benefits

- » Simple core configuration
- » Low capital cost

## Applications

- » Nuclear energy reactors

### Patent status:

Patent pending: U.S. and foreign rights are available.

### License status:

This technology is available for licensing to industry for further development and commercialization.

### Category:

Mechanical & Nuclear Engineering

### VCU Tech #:

22-040

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