SMALL-SCALE REACTOR FOR THE PRODUCTION OF MEDICAL ISOTOPES

Sandia National Laboratories

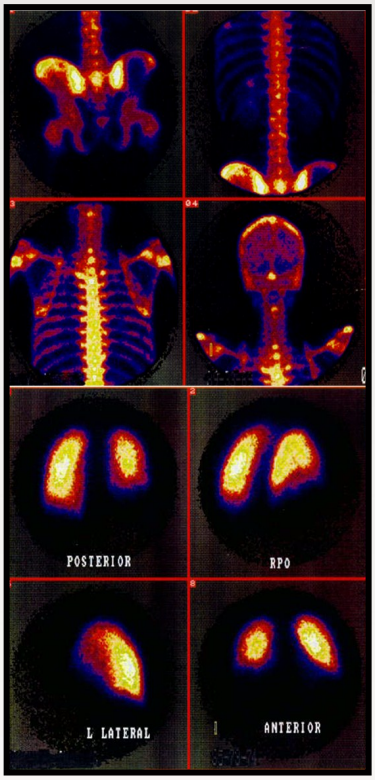
intellectual property MANAGEMENT, LICENSING, & ALLIANCES

TECHNOLOGY READINESS LEVEL: 5

KEY ELEMENTS HAVE BEEN DEMONSTRATED IN RELEVANT ENVIRONMENTS.

US PATENT PENDING

TECHNOLOGY SUMMARY



Immediate & Critical Need

Currently there is a severe worldwide shortage of medical isotopes– specifically Molybdenum-99 (Mo-99) which is essential in cancer treatment, diagnostics, and medical imaging. The US is completely dependent on foreign sources which means we have no domestic or backup supply. Further contributing to the problem, the current reactors are more than 50 years old which means there is a higher risk for unplanned outages and they are not dedicated to production. In late 2009, the US House of Representatives passed a bill for the production of medical isotopes to help establish a domestic supply using LEU fuel.

Financial Impacts

Current US demand for Mo-99 is equal to the demand of the entire world at 6,000 curies (Ci) per 6 day week. The pre-shortage rates had a demand growth of approximately 5-10% per year with estimated revenue from US demand yielding approximately $150 million per year. Due to the severe shortage, the price per Ci has drastically increased nearly three fold. At the current demand rate, the estimated revenue is $468 million per year.

With this technology, we could produce enough Mo-99 to satisfy US demand and have a surplus available to meet world demand needs. Additional isotopes other than Mo-99 are also produced as a result of this process and would be commercially valuable.

POTENTIAL APPLICATIONS

- Radiopharmaceutical companies & distributors
- Medical & healthcare facilities
- Medical diagnostics & cancer treatments

TECHNOLOGICAL BENEFITS

- Technology would allow us to meet global demand
- LEU fuel minimizes nuclear proliferation risk
- Operational at low power and passively safe
- Commercially available control system results in ease of operation

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 11290

or visit

https://ip.sandia.gov

NNSA National Nuclear Security Administration

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U.S. DEPARTMENT OF ENERGY