



Proudly Operated
by **Battelle** Since 1965

Battelle Number(s):

10598-E

Patent(s) Issued

Available for licensing in some
fields

Available Technologies

Method and Apparatus for Detecting Neutrons

SUMMARY

Pacific Northwest National Laboratory has developed a unique detection capability with the ability to identify thermal neutrons, which indicates the presences of various radionuclides like plutonium. This detection capability uses glass fibers, which are smaller, more flexible, less expensive, easier to produce and use, and sensitive over a much greater length than its current competition. A thermal neutron stopped by one of these fibers generates a pulse of light. The light travels along the fiber and is detected at the other end. If a thermal neutron reaction occurs, light is emitted. The fraction of the light that travels along the fiber is detected by photomultiplier tubes at the ends of the fibers and indicates a neutron has been captured. In principle, each fiber can detect from one to millions of neutrons per second. The development of neutron-sensing scintillating glass optical fibers opens the door to new and improved ways to protect society from the threat of nuclear terrorism and restore environments that have been contaminated through the production of nuclear weapons. Moreover, the new fibers raise the potential for safer, more efficient cancer-treatment techniques and could lead to breakthroughs in advanced materials research.

ADVANTAGES

- * flexibility of fibers allows for large area detection in application-specific geometries
- * physical flexibility and technical adaptability allow this technology to be used for many new applications



Patents & Intellectual Property

- » Patent #: 5,680,423

Technology Portfolio(s)

- » Radiation Sensors

Potential Industry Applications

- » Aerospace & Defense
- » Automotive & Transportation
- » Oil & Gas
- » Public Administration & Government
- » Recycling & Waste Management
- » Security

Dave L. Greenslade
Pacific Northwest National Laboratory
(509) 375-6555
david.greenslade@pnnl.gov
<http://availabletechnologies.pnnl.gov>



Proudly Operated by **Battelle** Since 1965