

RESEARCH AND TRAINING REACTORS

Position Statement

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The American Nuclear Society (ANS) recognizes that the nation's research and training reactors are important elements of the U.S. nuclear science and technology education, training and research infrastructure. Therefore, ANS endorses government, industry and university programs that maintain an appropriately sized fleet of research and training reactors at U.S. universities, national laboratories, and corporations.

The national interests served by training and research reactors include:

- Development of high-technology applications in fields such as materials science, fluid dynamics, and biomedical science where neutron sources are needed;
- Advances in the areas of power reactors safety and establishing the scientific bases for new reactor designs; and
- Training of personnel needed to operate, maintain, regulate and improve reactors and other facilities associated with national defense and nuclear power activities, and to manage and direct the technology development and nuclear science research needed to maintain the national infrastructure.

Reactors can be designed to be low power and relatively inexpensive so as to be affordable by educational institutions and small commercial organizations. They can be designed to operate at higher power levels and to provide a continuous supply of radiation to internal targets as well as external neutron beams which can be energy filtered or even cooled to very low temperatures for use as non-destructive probes. Reactors can also be designed to operate in a pulsed mode to examine the effects of radiation bursts on materials.

Reactors can continue to be used to provide very useful training to students or new researchers in neutron and radiation technologies and engineering education at the graduate level, and they provide powerful tools for the advancement of other academic disciplines. They provide undergraduate and graduate students with otherwise unobtainable 'hands-on' educational experiences, including the direct observation of nuclear fission reactor processes; developing an understanding of critical nuclear systems and the interaction of radiation with matter, and familiarity with nuclear regulatory and safety processes. All of these enrich their general and technical educations thereby providing personnel who can be further trained for other nuclear responsibilities, for example, as nuclear power reactor operators.

Reactors are particularly suited for research involving small angle neutron scattering and diffraction and spectroscopy studies that dictate a limited range of momentum and energy transfer to the targets. Reactors have pioneered the development of cold neutron beams important for macromolecular studies, which include polymers, colloids and complex fluids. Neutron radiography and neutron activation analysis services are also supplied by reactor facilities. For these various types of studies and services, research and training reactors are uniquely useful tools.

The American Nuclear Society recognizes the very special roles that research and training reactors have played and will play in government and industry programs, thus achieving and maintaining the U.S. position as a research leader. Research and training reactors provide powerful tools for meeting the scientific challenges of the 21st Century. Therefore, the ANS encourages innovative efforts and collaborations that enhance the utilization of existing research and training reactors, as well as those that address the next generation of nuclear research and training facilities for the 21st Century and beyond.

References:

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12. Testimony by James F. Stubbins, University of Illinois at Urbana-Champaign before the Energy Subcommittee, Committee on Science, U.S. House of Representatives, June 10, 2003.
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<http://www.house.gov/science/hearings/energy03/index.htm>

The American Nuclear Society, founded in 1954, is a not-for-profit scientific and educational society of over 11,000 scientists, engineers, and educators from universities, government and private laboratories, and industry.

Position Statements are the considered opinions and judgments of the Society in matters related to nuclear science and technology. They are intended to provide an objective basis for weighing the facts in reaching decisions on important national issues.