

Versatile Test Reactor (VTR) Experimental Capabilities

Friday 22 April 2022 14:42 (12 minutes)

The Versatile Test Reactor (VTR) is a proposed fast neutron spectrum test facility that will provide irradiation capabilities not currently available within the U.S. The Idaho National Laboratory (INL), in conjunction with five other U.S. national laboratories, 19 universities and 10 industry partners, is working to develop the VTR to provide an irradiation-testing facility capable of performing a wide range of tests to meet current and future experimental needs. The VTR will allow many research institutions to have access to fast neutrons that will support the development of advanced nuclear technologies. The VTR is envisioned to be a 300 MWth sodium-cooled, pool-type fast neutron spectrum (fission spectrum) reactor for neutron irradiation testing and research, and is anticipated to perform multiple irradiation test campaigns during its operational lifespan of up to 60 years. The proposed configuration of the VTR core comprises 66 driver-fuel assemblies, up to six dedicated/fixed test locations for instrumented vehicles, cartridge loop tests, and rapid transfer (rabbit) test vehicles, and the ability to replace a specific number of the 66 driver-fuel assemblies with open test assemblies. The ultimate goal of the experimental capabilities of the VTR is to provide a platform and test capability that will help increase the technology readiness level of advanced reactor fuels, materials, instrumentation, and sensors. In addition, it will provide the ongoing test capabilities that will support and sustain current and future nuclear reactor continuous technology improvements. This paper describes the different experiment vehicles being developed, and the different lab, university, and industry teams that are leading the design and development of each of the experiment vehicles.

Country/Int. organization

United States of America

Author: WEAVER, Kevan (Idaho National Laboratory)

Co-authors: Dr FARMER, Mitchell (Argonne National Laboratory); UNAL, Cetin (Los Alamos National Laboratory); Dr MCDUFFEE, Joel (Oak Ridge National Laboratory); Dr SABHARWALL, Piyush (Idaho National Laboratory); SALEH, Tarik (Los Alamos National Laboratory); WOOTAN, David (Pacific Northwest National Laboratory); Dr CETINER, Sacit (Oak Ridge National Laboratory); Dr RITTER, Christopher (Idaho National Laboratory); Dr WACHS, Daniel (Idaho National Laboratory)

Presenter: WEAVER, Kevan (Idaho National Laboratory)

Session Classification: 5.3 Experimental Programs II

Track Classification: Track 5. Test Facilities and Experiments