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Overview of IAEA Fast Reactor Related Technology Development Activities

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The International Atomic Energy Agency (IAEA) supplements and supports nuclear research and development with many efforts to improve and make nuclear data more accessible. Through technical community building research projects, and tool development, the Nuclear Power Technology Development section (NPTDS) provides many services and opportunities to amplify the research of member states'experts. The Fast Reactor (FR) team is guided by the TWG-FR (Technical Working Group on Fast Reactors), the longest operating technical group at the IAEA, by identifying topics for Technical Meetings, providing data for CRPs (Coordinated Research Projects) and proposing other opportunities to further develop fast reactors technology internationally. This paper details several of the projects and work that has been recently completed and the projects currently ongoing.

One of the most visible products of NPTDS are the CRPs. Each project typically lasts for four years and aims to produce a high-quality publication detailing the work of all contributors. This method provides an avenue for information and dating sharing, as well as an opportunity to compare and contrast different simulation tools in use around the world. This paper discusses the CRP process and explain how to contribute to upcoming projects. The Fast Reactor team of NPTDS currently has two ongoing FR CRPs: Neutronics Benchmark of CEFR Start-Up Tests, and Benchmark Analysis of FFTF Loss of Flow Without Scram Test. Recently completed in 2020, Source Term Estimation for the Prototype Sodium Fast Reactor (PSFR) is currently preparing for publication.

In addition to leading and facilitating CRPs, the IAEA focuses on capacity building and reducing barriers to entry of nuclear power. Most recently, this has been accomplished through tool development and open source code community building. In 2020-2021, the IAEA conducted several studies on particular topics such as passive shutdown systems for fast reactors, benefits and challenges of small modular fast neutron systems, interaction of structural materials and liquid heavy metals. By leveraging the vast historical data preserved at the IAEA, NPTDS is engaging in building new resources for analysis. One new project is the Sodium Properties Calculator web application, which demonstrates the initiative for future module development as an additional output of CRPs. ONCORE, the open source code initiative aims to build support resources and communities around analysis tools.

This paper provides an overview of the projects and initiatives of the IAEA in the area of fast reactors technology.

Country/Int. organization

IAEA

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