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International research center based on MBIR reactor –cornerstone for Generation 4 technologies development

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This report intended to provide an update on the International research center (IRC) based on the fast sodium research reactor MBIR development. The report will include the proposed IRC structure, key terms of participation, proposed areas for multilateral research, etc. It will also present the R&D possibilities that IRC members will have on the closed nuclear fuel cycle due to the Multi-functional radio-chemistry research facility, which is also being constructed at RIAR site.

MBIR reactor technical parameters (very high flux, up to 3 simultaneously working independent loops, horizontal and vertical channels, high experimental capacity and other features) ensure the needed experimental support for the R&D conducted to create the new generation innovative nuclear energy facilities. MBIR and Multi-functional radio-chemistry facility at one site will provide an opportunity to execute and perfect the closed fuel cycle and radioactive waste utilization. In addition the combination of those facilities will allow to conduct the complex material testing research including creation of the new constructive materials, fuel and absorbing materials as well as to perform complex experimental tasks with the use of neutrons for fundamental studies.

Both MBIR reactor and the radio-chemistry facility were awarded the ICERR status as part of RIAR facilities in September 2016. The high flux neutron fast reactor facility is a powerful instrument and cannot be realized small scale or as a modular complex which leads to high capital costs and overcapacity for a single user. This is one of the reasons behind the idea of the international partnership where one reactor can be used by multiple international users and research can be conducted both on bilateral and multilateral basis.

Country/Int. Organization

Russian Federation /
State Atomic Energy Corporation “Rosatom”

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