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Innovative TRU Burning Fast Reactor Cycle Using Uranium-free TRU Metal Fuel - Core Design Progress -

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Fast reactors have a capability to effectively burn TRU (transuranic) compared to LWR due to its higher fission-to-capture ratio of TRU and to reduce the burden of radioactive waste disposal. The most effective way to burn TRU is to use uranium-free TRU fuel since it does not produce any new TRU. In order to clarify the feasibility of uranium-free TRU burning fast reactor cycle with metal fuel, we have been investigating the related key technical issues not only on fuel cycle area but also reactor area since October, 2014 under the contract with Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan.
In this paper, among the various investigation items in this study, the progress of the core design study will be presented, which will shows the promising core to simultaneously achieve enhanced Doppler feedback and low sodium void reactivity for the uranium-free TRU metal fuel fast reactor, considering the evaluated fundamental properties of the fuel and secured core safety.

Country/Int. Organization

Japan, Toshiba Corporation

Primary author: Mr ARIE, Kazuo (Toshiba Corporation)

Co-authors: Mr HARA, Akihiro (Toshiba Corporation); Dr OHTA, Hirokazu (Central Research Institute of Electric Power Industry); Dr TSUBOI, Yasushi (Toshiba Corporation); Prof. ARITA, Yuji (University of Fukui)

Presenter: Mr ARIE, Kazuo (Toshiba Corporation)

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