RERTR 2017 - 38th INTERNATIONAL MEETING ON
REDUCED ENRICHMENT FOR RESEARCH AND TEST REACTORS

NOVEMBER 12-15, 2017
EMBASSY SUITES CHICAGO DOWNTOWN MAGNIFICENT MILE HOTEL
CHICAGO, IL USA

Current State of Conversion of the IGR Reactor and IVG.1M Reactor to LEU Fuel

A.D. Vurim, I.K. Derbyshev, E.T. Koyanbaev, V.V. Baklanov, V.S. Gnyrya,
A.S. Azimkhanov, V.A. Zuyev, D.A. Ganovichev, Yu. A. Popov, A.N. Kolbayenkov
The Institute of Atomic Energy of the National Nuclear Center of Republic of Kazakhstan
10, Krasnoarmeyskaya St., Kurchatov-city, 071100, Republic of Kazakhstan
and
N. A. Hanan, P. L. Garner
Nuclear Engineering Division
Argonne National Laboratory, 9700 South Cass Avenue, Lemont, Illinois, 60439, USA

ABSTRACT

The IVG.1M and IGR research reactors are operated by the National Nuclear Center of Republic of Kazakhstan. The reactors were designed to work with high-enriched uranium (HEU) fuel, however, in accordance with the agreement on the non-proliferation of nuclear weapons, HEU fuel should be replaced with a low-enriched uranium (LEU) fuel. In this connection, a decision was made to implement the conversion of the IVG.1M and IGR reactors. The process of reactor's HEU to LEU conversion consists of a number of scientific, technical and engineering tasks, some of which have been solved to the present.

To date, two experimental channels with LEU fuel have been loaded into the IVG.1M reactor for carrying out complex tests. Upgrade and commissioning of the information and measuring system (IMS) was carried out. To test the modernized IMS, as well as to study the coolant of the reactor for the content of fission products, the start-up of the IVG.1M reactor was implemented at a power of 3 MW. As a result of the start-up it has been established that the IMS works stably, the content of the fission products in the coolant is within the normal range. The first start-up from the series of complex tests of two LEU-fueled experimental channels of the IVG.1M reactor was carried out.

Out-of-reactor studies of HEU fuel assemblies of the IGR reactor were conducted to study the structure, strength characteristics, phase composition, distribution of fuel components. An operational test plan has been developed for the IGR reactor for testing new samples of graphite blocks with LEU fuel.