

The Troitsk ADS project

S.F. Sidorkin, L.V. Kravchuk, A.V. Feschenko

Institute for Nuclear Research Russian Academy of Sciences
60th October Anniversary Prospect 7a, Moscow 117312, Russia

M. Bourquin, F. Carminati, J.-C. de Mestral, F. Gerigk, V. Grichine, R. Gimalov, Y. Kadi,
E. Lillestol, M. Losasso, J.-P. Revol, K. Samec

International Thorium Energy Committee
17, rue Francois-Dussaud, 1217 Geneva, Switzerland

Corresponding Author(s): sidorkin@inr.ru

Abstract

This report summarizes the results of discussions of a Research ADS Stand at the Institute for Nuclear Research (INR), to couple for the first time a proton beam to a subcritical core at a thermal power exceeding 1 MW (1 to 3 MW) for investigations in areas of nuclear transmutation and thorium fuel cycle.

The existing infrastructure provided by the INR linear accelerator and experimental area is a great asset, however, it imposes restrictions on the level of power and various technical aspects of the project, which will be discussed. The basic approaches to the design process are stated. Possible physical and design features of the Research ADS Stand, from the point of view of physical and technical safety at all stages of work, are considered.

Among other aspects, the horizontal insertion of the beam, additional barriers for safety to exclude loss of coolant, features of the tungsten and uranium targets providing the maximal neutron yield and rather long lifetimes, owing to the distributed thermal load on the beam window, will also be discussed. Results of the initial design studies will be given.

Further directions of research for the development of the neutron facility at INR will also be presented.