TESTS OF THE ITER DIAGNOSTIC "DIVERTOR NEUTRON FLUX MONITOR" DATA ACQUSITION SYSTEM PROTOTYPE UNDER THE INTENSIVE NEUTRON IRRADIATION [[1]](#footnote-1)\*)

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"Divertor Neutron Flux Monitor" is one of ITER the neutron diagnostics, designed to measure the total neutron yield. The expected neutron flux density at the location of the detectors is in the range from 103 upto 1013 n/(cm2s). To resolve the problem of the neutron flux density measuring in a dynamic range of 10 orders of magnitude with a time resolution 1 ms, the detector module with two 3-section fission chambers and a multichannel data acquisition system are developed. To confirm the possibility of measuring the neutron flux density in a wide dynamic range using such a detection module and assessing the characteristics of the data acquisition system prototype, a number of tests were carried out under intense neutron irradiation. The detector assemblies for tests are structurally similar to those planned for use on the ITER.The mobile version of the data acquisition system prototype was used. The tests were carried out at the neutron laboratories based on the NG-24M neutron generator with a yield of 1011 n/s, and onother on the IBR-2 pulsed fast reactor with a neutron flux at the moderator of 109 - 1012 n/(cm2s) with a peak power of 1.6 - 1.85 MW. In the course of tests at the neutron laboratory the operability of the mobile version of the prototype was checked, the averaged pulse shape and amplitude spectrum of all fission chambers were recorded, and data was obtained for calibrating the measuring channels of the data collection and processing system. During the tests at the IBR-2 reactor, the signals from the measuring channels of the subsystem were recorded when the neutron flux density was changed. The report presents the test results and discusses approaches to calibration procedures for the ITER neutron diagnostics subsystem. The work was performed in accordance with the state contract dated 21.04.2020 No. Н.4а.241.19.20.1042 "Development, pilot production, testing and preparation for the supply of special equipment to ensure the fulfillment of Russian obligations under the ITER project in 2020".

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVIII/E/ru/IG-Kashchuk.docx) [↑](#footnote-ref-1)