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PAPER TITLE Application of low-pressure tissue-equivalent proportional counter in IHEP radiation protection

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ABSTRACT (See instructions overleaf)

The mixed radiation fields behind shielding of the 70-Gev proton synchrotron is composed of thermal and fast neutrons; high energy particles, photons and charged particles. One of the major techniques for direct dose equivalent measurements in such mixed radiation fields is based on low-pressure tissue-equivalent proportional counters (TEPC). The TEPC has been designed in collaboration with Institute of Biophysics (Moscow). The main technical data of TEPC are presented. The instrument allows us to measure kerma and dose equivalent for photons and neutrons simultaneously in a single measurement. The separation technique in treatment of the pulse height spectrum with threshold in terms of linear energy is used to obtain the neutron dose equivalent. Calibration of the TEPC in terms of neutron and photon kerma are presented. The problem concerned with TEPC calibration in terms of ambient dose equivalent have been solved by the calibration in the National primary standard neutron fields of VNIIFTRI (State Standard Committee of Russia, Mendeleev). TEPC are used for metrological assurance of radiation protection at IHEP. The results of a simple routine neutron dosimeters calibration by TEPC in a mixed accelerator radiation fields are presented. Experimental results of dose characteristics measurements are presented for the reference fields of IHEP and JINR (Dubna, Russia). The results are compared with the other dosimetric systems ones.