

Revisiting Assessment of Radioactive Gases Emanated in the Storage Area of Spent Nuclear Fuel at BN-350 Reactor

A comprehensive radiation assessment and possible long-term predictive estimates of the radiation situation at places of long-term storage require oversight of radioactive gas emanation. For which reason, it is necessary to develop and implement respective recommendations for research and future oversight of the content of radioactive gases in air of SNF storage areas. Experimental research was undertaken to fulfil the task that was set during IVG.1.M physical start-ups. Air was sampled from the conduit of reactor ventilation system using two devices: “Purga” cryogenic device and “OS1700” tritium manifold. Air sampled collected by “Purga” were measured with a gamma-spectrometer having a GC-1518 coaxial germanium detector. Air samples collected with the tritium manifold were analyzed with a “SL-300” beta-spectrometer. Experimental studies conducted registered the major radioactive gases: ^{41}Ar 30 to 4,500 Bq/m³, for ^{85}Kr up to 280 Bq/m³, for ^{87}Kr up to 720 Bq/m³, for ^{88}Kr up to 840 Bq/m³, for ^{135}Xe up to 140 Bq/m³, for HTO up to 20 Bq/m³ and for Tgas up to 3 Bq/m³. Experimental studies undertaken have shown applicability in principle to use sampling and analytical equipment for assessing radioactive gases emanated in a SNF storage area at BN-350.

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