

2nd International Conference on

NUCLEAR CHEMISTRY

November 15-16, 2017 | Las Vegas, USA

Comparative study of the derived emission limits for the radioactive effluents resulted from VVR-S nuclear research reactor decommissioning

Carmen Tuca and **R Deju**

Horia Hulubei National Institute for Physics and Nuclear Engineering, Romania

The study presents a comparative analysis of the derived emission limits (DELs) for the radionuclides from the gaseous and liquid effluents resulted during the decommissioning process of the VVR-S nuclear research reactor. The DELs are calculated in order to determine the radiological impact of these activities on the critical group (infants and adults located in the Magurele city, starting with 1 km distance from the reactor). The methodologies for doses and derived emission limits calculation are described and DELs are calculated taking into account a dose constraint of 50 $\mu\text{Sv}/\text{year}$ for the critical group members. The gaseous effluents result from the cutting process of the reactor activated/contaminated components and structures and from the demolition of the concrete biological shielding. The liquid effluents are from the pools for long term storage of the nuclear spent fuel and also from the wet cutting process of the above mentioned components and decontamination of the workers or equipments. The released activities of gaseous effluents are much lower than the DEL-s for gaseous effluents, corresponding to the effective dose constraint of 50 $\mu\text{Sv}/\text{year}$ (for 2013), 10 $\mu\text{Sv}/\text{year}$ (for 2014, 2015 and 2016) and these constraints are fully accomplished. On the contrary, for the liquid effluents the released activities are systematically higher than the DELs for the most radionuclides. In 2014 and 2016 these arriving up to 39 times, respective 165 times for ^{90}Sr , the most significant beta pure emitter. A deeper analysis can be done taking into consideration a mixture of ^{90}Sr and ^{63}Ni occurring from the metallic components containing it. The effective dose constraint of 40 $\mu\text{Sv}/\text{year}$ for critical group is not accomplished and the effluents must be treated as liquid wastes.

Biography

Carmen Tuca has completed her master's studies in Theoretical Physics and Mathematics at University of Craiova, Faculty of Physics. Now she is a PhD student in Nuclear Physics at University of Bucharest, Faculty of Physics. She is a Scientific Researcher of IFIN-HH, at the Reactor Decommissioning Department, responsible for environmental, occupational health and safety. She has published more than 15 papers in scientific journals.

tuca@nipne.ro

Notes: