

## DETERMINATION OF POTENTIAL AREAS OF INFLUENCE ON THE ROMANIAN TERRITORY OF UKRAINIAN NUCLEAR POWER PLANTS IN THE CONTEXT OF THE CRISIS GENERATED BY THE RUSSIAN-UKRAINIAN CONFLICT

Alexandru O. PAVELESCU<sup>1</sup>, Valentin T. ACASANDREI<sup>2</sup>,  
Bogdan I. VAMANU<sup>3</sup>, Dan V. VAMANU<sup>4</sup>, Mărgărit PAVELESCU<sup>5</sup>

**Abstract.** *In the context of the crisis generated by the Russian-Ukrainian conflict, radiological situation forecasts were made within the National Institute of Research and Development for Physics and Nuclear Engineering "Horia Hulubei" (IFIN-HH) for all nuclear power plants in Ukraine. Therefore, the resident decision support software systems for radiological and nuclear emergencies were used, with the main purpose of identifying potential areas of influence on the territory of Romania generated by Ukrainian power plants, as consequence of military actions. In the absence of pertinent and confirmed information, two hypothetical scenarios were considered by which the radioactive material could be dispersed into the atmosphere, for which appropriate accident source terms were built, using methods validated and approved by the international organizations in the field. The monitoring of the radiological situation of the Ukrainian nuclear power plants was carried out over a period of several months starting from the first day of the conflict outbreak. In the paper are presented comparative results obtained with two software systems for a representative case at the Zaporozhe Nuclear Power Plant, the largest nuclear power plant in Europe, situated in the center of several disputes.*

**Keywords:** Decision-making support systems; Situation forecasts; Potential areas of radiological risk; Total effective dose equivalent (TEDE)

**DOI** <https://doi.org/10.56082/annalsarsciphyschem.2023.1.26>

---

<sup>1</sup> PhD, Department of Life and Environmental Sciences, "Horia Hulubei" National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Reactorului Str. No.30, PO-Box: MG-75126, Bucharest-Magurele, Romania (e-mail: alexandru.pavelescu@nipne.ro).

<sup>2</sup> PhD, Department of Life and Environmental Sciences, "Horia Hulubei" National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Reactorului Str. No.30, PO-Box: MG-75126, Bucharest-Magurele, Romania (e-mail: tacasan@nipne.ro).

<sup>3</sup> PhD, Department of Life and Environmental Sciences, "Horia Hulubei" National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Reactorului Str. No.30, PO-Box: MG-75126, Bucharest-Magurele, Romania, (e-mail: bvamanu@nipne.ro).

<sup>4</sup> PhD, Department of Life and Environmental Sciences, "Horia Hulubei" National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Reactorului Str. No.30, PO-Box: MG-75126, Bucharest-Magurele, Romania, (e-mail: dvamanu@yahoo.com).

<sup>5</sup> PhD, Chairman of Physics Section, Academy of Romanian Scientists (AOSR), Ilfov Street, No. 3, Sector 1, Bucharest, Romania (e-mail: mpavelescu2002@yahoo.com).