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**WASTE PRODUCTS OF HEAT POWER INDUSTRY
AS A POWERFUL FACTOR AFFECTING PUBLIC HEALTH
AND LIVING CONDITIONS OF POPULATION**

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Waste of heat power industry ranks first in terms of volume in all industrialized countries. For disposal of waste generated by these sectors, the largest areas are allocated, where wastes are placed outdoors, and operating parameters of these facilities, namely high potential of dust generation, cause a negative impact on the living conditions of people in the settlements nearest to the waste ponds and become a powerful source of pollution of environment with hazardous substances.

The subject of studies was the waste generated during burning of coal in the boilers — the ash and slag mixture and waste product — vanadium-containing sludge formed during combustion of the oil-gas mixture in boilers. The hazard degree of wastes was established on the basis of calculations of their hazard category in accordance with the regulatory documents by parameters of acute toxicity of substances and mixtures and their evaluation, taking into account adequate routes of exposure, primarily inhalation, according to European Parliament and Council Directives – European communities (75/442/EEC dated 15 July 1975, 2008/98/EC dated 19 November 2008 «On Waste», European Parliament and Council Directive 2006/12/EC dated 5 April 2006, Council Directive (91/689/EEC) dated 12 December 1991 «On Hazardous Waste», Council Directive No. 91/689 «On Hazardous Waste», Commission Decision (dated 3 May 2000) and Regulations (EC) No. 1272/2008 of the European Parliament and of the Council (dated 16 December 2008). Calculations of the ratio of the total concentration of all toxic components in the ash and slag mixture (ΣC_i) to a total value of assessment of acute toxicity of these substances (ΣATE_i) showed that the coefficient obtained: ($\Sigma [C_{mix}] / \Sigma ATE_{mix}$) = 9.540267/19.97184 = 0.4776859) allows to attribute the ash and slag mixture, based on the scale for defining the hazard category, to Category 2 (0.05 < Category 2 ≤ 0.5) – Class II (highly hazardous) in case of exposure by inhalation - according to the Commission Decision (dated 3 May 2000) EC and EC Council Regulations (No. 1272/2008 dated 16 December 2008). The hazard

category of the ash and slag mixture in case of oral exposure is determined by the coefficient obtained: $(\Sigma[C_{\text{mix}}]/\Sigma\text{ATE}_{\text{mix}})=9.540267/0.01915041 = 498.17$, allows to characterize the ash and slag mixture as a waste product of Category 4, i.e. Class IV – «low-hazardous» in accordance to the evaluation of acute toxicity range ($300 < \text{Category } 4 \leq 2000$) for oral exposure – according to the Commission Decision (dated 3 May 2000) and EC Regulation No. 1272/2008 (dated 16 December 2008). The hazard degree of vanadium-containing sludge in case of oral exposure determined with the use of coefficient $(\Sigma[C_{\text{mix}}]/\Sigma\text{ATE}_{\text{mix}}) = 31.1985266/98.968924 = 0.315$, indicates that, in accordance with the hazard scale, the waste product – sludge from the waste pond — belongs to Category 2 ($0.05 < \text{Category } 2 \leq 0.5$) in case of oral exposure - according to the Commission Decision (dated 3 May 2000) and EC Regulations No. 1272/2008 (dated 16 December 2008). The hazard degree of this waste product determined based on the evaluation of acute toxicity in case of oral exposure showed that the ratio is $\Sigma(C_{\text{mix}})/\Sigma(\text{ATE}_{\text{mix}}) = 31.1985266/0.35294152 = 88.395739$, that indicates that, in accordance with the scale of the hazard category range, the waste product— sludge — belongs to Category 3 ($50 < \text{Category } 3 \leq 300$), the corresponds to Class III (moderately hazardous) according to the Commission Decision (dated 3 May 2000) and Regulations (EC) No. 1272/2008 of the European Parliament and of the Council (dated 16 December 2008).

The results obtained indicate that the determination of the hazard degree of waste — establishing of the hazard class based on the provisions of the EU regulatory documents is legitimate in terms of taking into account all the toxicity characteristics of components of complex chemical mixtures that are the part of waste, and allow to evaluate waste following these documents by their hazard degree taking into account of priority routes of exposure, primarily oral and inhalation routes. Based on the results obtained, we also believe it necessary to note that when using the mentioned method for determination of the hazard class of industrial waste, conditions of handling this waste becomes the critical factor, thus, if dust generation is excluded at all the stages of accumulation, storage, transportation and disposal of waste and thus inhalation exposure is blocked, in many cases the hazard category of such waste will be significantly reduced.