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RISK ANALYSIS REGARDING THE EXCEEDING OF EMISSION LIMIT VALUE AND ESTABLISHING THE TYPE OF AIR EMISSIONS MONITORING

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Introduction

Air pollution is a great importance domain in assessing the quality of the environment due to the special impact it can be induced both on human health and on other environmental factors influence with which it is directly interdependent. Keeping air quality under control requires the use of the best techniques and manufacturing technologies coupled with the most efficient methods/techniques for reducing pollutant emissions but also with appropriate methods/methodologies for monitoring the concentration of specific pollutants emitted into the air. Similar to the regulation of industrial areas covered by the IPPC, the European Commission has developed and implemented a document that updates and explains the latest environmental monitoring methodologies (JRC Reference Report on Monitoring of Emissions to Air and Water from IED installations, 2018); one of the recommended methods in this regard is based on *the assessment of the risk of exceeding the emission limit value (ELV)*, the method explained in this paper.

Materials and methods

The method of establishing the most appropriate technique for monitoring air emission pollutants by assessing the risk of exceeding the emission limit value involves establishing the two parameter calculation risk, respectively the probability of exceeding the limit value (probability) and the consequences of this exceeding (severity of the effects). In Fig. 1 presents a simple matrix constructed based on the probability of exceeding the limit value (probability) versus the consequences of this exceeding (severity of effects) and information on the interpretation of the values of the risk obtained; risk values underlie the process of selecting the technique and frequency of monitoring.

Starting from the results of the risk analysis, the monitoring regime for air emissions can be interpreted as follows:

- 1 - occasional – periodic measurements once every three years up to once/year
- 2 - regular – periodic measurements once per year up to twice per year
- 3 - frequent - continuous or periodic measurements (several times per year)
- 4 - intensive - continuous measurements

Likelihood	High	3	4	4
	Medium	2	3	4
	Low	1	2	3
1- Occasional 2- Regular 3- Frequent 4- Intensive		Low	Medium	High
Severity of consequences				

Figure 1. Monitoring regime depending on the risk of exceeding the ELV.

For exemplification, the method was applied to a household waste incineration plant located away from the residential area and equipped with a high-performance system to reduce the emission of air pollutants.

Results and conclusions

The parameters that could be taken into account in assessing the risk of exceeding the ELV, respectively, the probability of exceeding the limit value and the consequences of this exceeding for the incinerator are presented in Table 1.

The situations characteristic of the incinerator are visualized in colour in the datasheets and indicate an average risk for both parameters for calculating the risk of exceeding the ELV.

Table 1. Factors for the risk assessment of exceeding ELV

Risk factor	Risk level		
	Low	Medium	High
Risk factors influencing the likelihood of exceeding the ELV			
capacity and functioning of the abatement system	High	Medium	Low
Stability of operating conditions	Stabile	ocasional instabile	instabile
possibility of diffuse emissions	Low	Medium	High
risk of accidents causing unexpected emissions	Low	Medium	High
Maximum possible emission load	Significantly below the ELV	Around the ELV	Significantly above the ELV
Risk factors influencing the consequences of exceeding the ELV			
Duration of potential failure	Short (< 1 hour)	Medium (1 hour - 1 day)	Long (> 1 day)
Location of the installation	Industrial area	Safe distance to residential areas	Residential area nearby

Corresponding to these values for likelihood and severity of consequences the risk of exceeding the ELV has the value of **3**, corresponding to **frequent risk of exceeding the limit value**; this risk requires continuous or periodic measurements (several times per year) for the emission source related to the incinerator.