

SECTION 10. ENVIRONMENTAL TECHNOLOGIES

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CONTINUOUS COMPREHENSIVE CONTROL OF ENVIRONMENTAL IMPACT DURING FILLING STATION PLANNED ACTIVITY

БЕЗПЕРЕРВНИЙ КОМПЛЕКСНИЙ КОНТРОЛЬ ВПЛИВУ НА ДОВКІЛЛЯ ПІД ЧАС ПЛАНОВАНОЇ ДІЯЛЬНОСТІ АЗС

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Introduction. The environmental safety issues of the filling station network operation are related to several aspects. First, there is the issue of the negative impact on the environment due to development of car service network as a result of the individual vehicles fleet expansion, its size has increased from 1 to 1.42 billion over the past ten years. Second, the potential danger of filling station's planned operation is increased due to increasing of their functionality. 85% of the man-made load falls on atmospheric air, the volumes of emitted harmful substances depend on such factors as ambient temperature, pressure and volume of the gas space, the contact area of the oil product with the gas space, the level of atmospheric pressure, the speed of the processes of acceptance and sale of fuel [1]. The risk zone of hazardous factors exposure also includes the aquatic environment and soils, which are

affected by groundwater contamination due to accidental spills of petroleum products and constant leaks from underground fuel storage tanks [2], [3].

Results. So, the main goal of the work is to develop a system for continuous operational monitoring of environmental condition of a man-made facility for early detection of the negative impact on the environment from the filling station's planned activities [4]. Figure 1 shows the scheme for the risk factors complex impact on the environment and population morbidity that was based on results of the filling stations planned activity analysis.

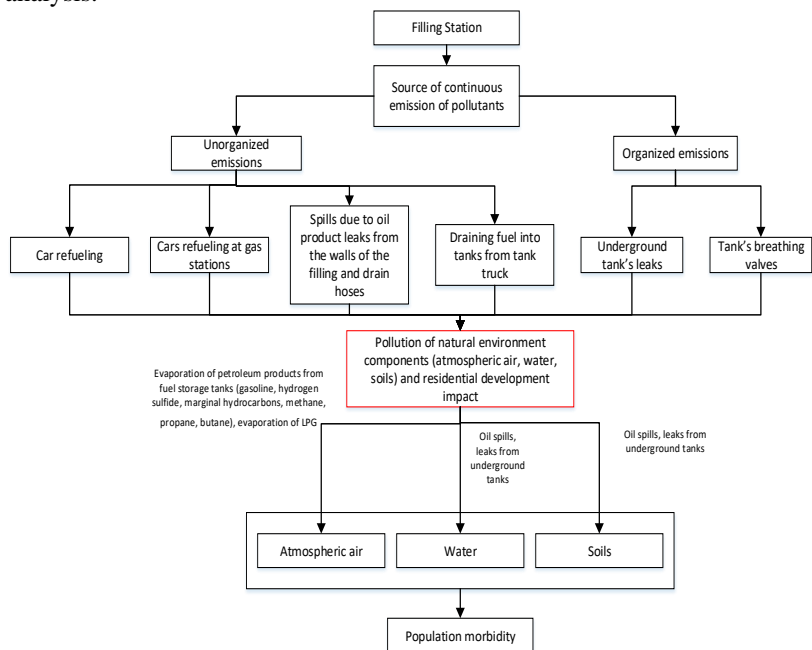


Fig. 1. Scheme of filling station's emissions impact on the environment

As a result of detailed study of dangerous risk factors from all probable sources during the filling station's operation, it was noted that the environmental impact assessment (EIA) should include the volumes of man-made loads on all ecosystems. To implement a comprehensive monitoring system at such hazardous facilities, it is proposed to use an information and software application designed to promptly respond to the current situation during their work. The environmental control department can obtain information about the man-made impact level on the environment by the

components of discharges and emissions from gas station operations in real time and its scale from software processing of measuring instruments data.

As the result, the application determines the general complex indicator of the filling station's planned operation's impact, according to which the conclusion about the operation of the man-made facility safety for the environment is formed.

Conclusion. To create the system for comprehensive consideration of environmental hazard factors in gas station operations it is proposed to develop an information and analytical system for environmental control at filling stations based on a system approach for comprehensive assessment of the environment, which will allow early access to the information about possible sources of risk and the introduction of preventive measures to avoid environmental damage.

Bibliography:

1. Чугай А. В. Оцінка впливу експлуатації автозаправних станцій на навколишнє природне середовище. *Вісник ХНАДУ*. 2015. Вип. 71. С. 98–102.
2. Wu Q., Zhang X., Zhang Q. Current situation and control measures of groundwater pollution in gas station. *Earth and Environmental Science*. 2017. Вип. 94. С. 1–6.
3. Кузьменко Е., Багрій С., Штогрин М. Визначення джерел забруднення підземних вод нафтопродуктами (на прикладі території Солотвино в Прикарпатті). *Вісник Київського національного університету імені Тараса Шевченка. Геологія*. 2019. Вип. 3(86). С. 40–47.
4. Желновач Г. М. Аналіз екологічних впливів та ризиків при експлуатації автозаправних станцій осіб. *Вісник ХНАДУ*. 2014. Вип. 67. С. 78–88.