Abstract: Odor emission from terrain is usually of an incidental character and depends in general on local meteorology. Therefore, for prognosis of propagation of chemical compound emission in the odor generating event of plant failure an appropriate mathematical model should be applied. In this paper, an emergency situation involving styrene storage tank failure was examined. Analysis of styrene propagation was performed using Polish reference model based on Pasquill's formula and CALPUFF model. The studies haves shown that odor concentrations in the vicinity of the plant calculated using the reference model were about 10 times lower than in case of CALPUFF model. Analysis of the results showed that outside the plant boundary styrene concentrations exceeding the value of 0.43 mg/m^3 (1000 times above the threshold) occurred within a distance of up to 1000 m. The reference values for styrene (D1h=0.02 mg/m^3) and odors (1 ou$_E$/m^3) were shown to be exceeded 100 times within the area of modeling. It was concluded that the increased odor concentration may be an indicator of a possible chemical installation failure or of an uncontrolled harmful chemical substance emission.

Keywords: Odors, styrene, reference model, CALPUFF.