**UDC 519.6**

**HEAT RADIATION FROM FIRE SPILL OF FLAMMABLE LIQUID**

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Chemical industry enterprises tend to consolidate, which leads to the concentration of dangerous chemicals on a relatively small area. One of the important causes of major accidents is the "domino effect".

The main factor of the "domino effect" is the heat flow to neighboring technological facilities. The dynamics of the change in the shape and size of a liquid spill is determined by the following processes: liquid spreading over the soil surface; liquid burnout; filling surface irregularities with liquid; percolation of liquid deep into the soil. To determine the dynamics of liquid spreading, a model was built, which is a system of differential equations. The first equation is an equation of the parabolic type and describes the spreading of the liquid, taking into account its costs for impregnation, filling surface irregularities and burning. Surface irregularities are taken into account by introducing a term containing the average depth of the irregularities into the differential equation [1]. The need to fill these irregularities when the liquid spreads determines the area of the spill. The second equation is an ordinary differential equation and describes the infiltration of liquid into the soil.



1 – filling area;

2 – liquid volume on the soil surface (on the right axis);

3 – the volume of liquid that seeped into the soil (on the right axis)

Fig. 1. Dynamics of diesel fuel spreading on an inclined surface.

Analysis of Fig. 1 shows that the area of spillage increases, asymptotically approaching the limit value of 28 m2. At this value of the area, the volume of liquid flowing out per unit of time is equal to the flow of liquid due to impregnation and burning.

The results of modeling under the condition of continuous liquid flow proved that when spreading on a horizontal surface, the spill has the shape of a circle, and on an inclined surface - the shape of an oval elongated in the direction of the slope of the surface. At the same time, the spill area does not depend on the angle of inclination of the surface. The maximum spillage area is determined by the flow of liquid due to impregnation and burnout. Volume flow of liquid due to burnout is proportional to the burning area. Liquid losses due to seepage first increase with the increase in spill area, and then decrease due to greater resistance from the already wetted soil. Over time, the spill area increases, asymptotically approaching its maximum value.

**REFERENCES**

1. Abramov Y., Basmanov O., Oliinik V., Khmyrov I. Justifying the experimental method for determining the parameters of liquid infiltration in bulk material // Eastern-European Journal of Enterprise Technologies. 2022. 4/10 (118). P. 24-29.