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Natural hazards impact on the technosphere from the point of view of the stability and chaos theory

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Technological disasters occur when the technosphere gets into the transition interval from its stable state to the chaos. Unstable state of the system is one of the possible patterns in scenario of dynamic transition to a chaotic state through a cascade of bifurcations. According to the theory of stability, the chaotic dynamics of the state is caused due to a constant supply of energy into the system from the outside. The role of external source of energy for the man-made technosphere play environmental impacts such as natural hazards or phenomena. A qualitative change in the state of the system depends on the scale and frequency of these natural impacts. Each of the major natural-technological catastrophes is associated with a long chain of triggers and effects in the unfavorable combination of many unlikely accidental circumstances and human factors. According to the classical Gaussian distribution, large deviations are so rare that they can be ignored. However, many accidents and disasters generate statistics with an exponental distribution. In this case, rare events can not be ignored, such cases are often referred to as "heavy-tailed distributions". We should address them differently than the "usual" accidents that fit the description of normal distributions. In the case of "an exponental disaster" we should expect the worst. This is a sphere in which the elements of the stability and chaos theory are of a crucial position. Nowadays scientific research related to the forecast focus on the description and prediction of rare catastrophic events. It should be noted that the asymptotic behavior of such processes before the disaster is so-called blow-up regime, where one or more variables that characterize the system, grow to infinity in a finite time. Thus, in some cases we can reffer to some generic scenarios of disasters. In some model problems, where some value changes in chaotic regime and sometimes makes giant leaps, we can identify precursors that signal danger.