



Critical infrastructure: impacts of natural hazards and consequences

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Critical infrastructure such as oil and gas pipelines, transmission facilities, heat-, and water supply, lines of communications, roads, railways as well as air and water transport play the key role in social and economic development of every country. Therefore, accidents causing failures and breakdowns of critical infrastructure facilities have the most drastic consequences for the society, economy, and environment. For example, road accidents cause the highest number of fatalities and injuries all over the world, especially in the middle-income countries. The so-called “blackouts” or accidental losses of electric power and power outages entail serious social troubles and heavy economic losses. The pipeline ruptures and oil-tanker crashes accompanied by oil releases cause the most severe environmental and large material damages. Critical infrastructure facilities are most vulnerable to the impacts of natural hazards that trigger many accidents in them especially in the regions most at natural risk.

The Russian Federation has more than 2.6 million km of transmission facilities, 940,000 km of roads, 102,000 km of inland waterways, 86,000 km of railways, and more than 70,000 km of trunk pipelines. Many facilities are beyond of their service life and need reconstruction. A very high level of deterioration and “human factor” are the main cause of accidents, ruptures, and crashes. However, natural hazards and disasters also play an essential (sometimes a leading) role in triggering or magnifying accidents in these objects. Thus, natural factors cause more than 70 percent of all “blackouts”, about 20 percent of accidents at heat- and water supply systems and water accidents, five percent of pipeline ruptures, and about two to three percent of air crashes, road, and railway accidents. The influence of natural factors is stronger in the North-Western and Central parts of the European Russia, in Krasnodarsky Territory (South of Russia) and in Far East that are more exposed to hurricanes, snowstorms, rainfalls, icing, landslides, and other natural hazards. Critical infrastructure facilities located in these regions need a special protection and modernization.