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Multi-hazards risk assessment at different levels

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Natural and technological disasters are becoming more frequent and devastating. Social and economic losses due to those events increase annually, which is definitely in relation with evolution of society. Natural hazards identification and analysis, as well natural risk assessment taking into account secondary technological accidents are the first steps in prevention strategy aimed at saving lives and protecting property against future events. The paper addresses methodological issues of natural and technological integrated risk assessment and mapping at different levels [1, 2]. At the country level the most hazardous natural processes, which may results in fatalities, injuries and economic loss in the Russian Federation, are considered. They are earthquakes, landslides, mud flows, floods, storms, avalanches.

The special GIS environment for the country territory was developed which includes information about hazards' level and reoccurrence, an impact databases for the last 20 years, as well as models for estimating damage and casualties caused by these hazards. Federal maps of seismic individual and collective risk, as well as multi-hazards natural risk maps are presented.

The examples of regional seismic risk assessment taking into account secondary accidents at fire, explosion and chemical hazardous facilities and regional integrated risk assessment are given for the earthquake prone areas of the Russian Federation.

The paper also gives examples of loss computations due to scenario earthquakes taking into account accidents trigged by strong events at critical facilities: fire and chemical hazardous facilities, including oil pipe lines routes located in the earthquake prone areas.

The estimations of individual seismic risk obtained are used by EMERCOM of the Russian Federation, as well as by other federal and local authorities, for planning and implementing preventive measures, aimed at saving lives and protecting property against future disastrous events. The results also allow to develop effective emergency response plans taking into account possible scenario events. Taking into consideration the size of the oil pipe line systems located in the highly active seismic zones, the results of seismic risk computation are used by TRANSNEFT JSC.

References

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