



## NOVEL INDICATORS FOR IDENTIFYING CRITICAL INFRASTRUCTURE AT RISK FROM NATURAL HAZARDS

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Extreme, low probability, natural hazard events can have a devastating impact on critical infrastructure (CI) systems in Europe. The European project INFRARISK (Novel Indicators for identifying critical INFRAstructure at RISK from natural hazards) aims to develop reliable stress tests to establish the resilience of European CI to rare low frequency extreme events and to aid decision making in the long term regarding robust infrastructure development and protection of existing infrastructure.

The core objective of the INFRARISK project is to develop a stress test framework to tackle the coupled impacts of natural hazards on interdependent infrastructure networks through identifying rare low-frequency natural hazard events, which have the potential to have extreme impacts on critical infrastructure. A stress test structure will be developed for specific natural hazards on CI networks and a framework for linear infrastructure systems with wider extents and many nodal points (roads, highways and railroads) further applicable across a variety of networks (e.g. telecom, energy). An integrated approach to hazard assessment considering the interdependencies of infrastructure networks, the correlated nature of natural hazards, cascading hazards and cascading effects, and spatial and temporal vulnerability will be established and implemented through the development of GIS based and web based stress test algorithms for complex infrastructure networks. The developed framework will be tested through simulation of complex case studies.

The methodological core of the project will be based on the establishment of an "overarching methodology" to evaluate the risks associated with multiple infrastructure networks for various hazards with spatial and temporal correlation. Interdependency will be formalised and damage will be defined in terms of capacity decrements. This will be the basis for the development of stress tests for multi-risk scenarios and will define the general framework, providing a tool for decision making based

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on the outcome of the stress test. The overarching methodology will capture and incorporate, into a GIS platform, outputs from an extensive profiling of natural hazards and infrastructure, and analysis of single event risk for multiple hazards and space-time variability of a CI network. An INFRARISK strategic decision support tool will be developed to ensure network models and stress test procedures are integrated and used under specific process workflows and modules. Further application to selected case studies to verify the modelling techniques and procedures developed in INFRARISK will be carried out.

As a crucial aspect of the project, dissemination of results will involve several target levels, the development of focused materials and products to reach the widest audience possible, and the formulation of specialised training courses.