**Research Area:
Protecting citizens from
environmental hazards**

INFRARISK

Novel Indicators for identifying critical INFRAstructure at RISK from natural hazards

Project Description

Extreme natural hazard events such as earthquakes, landslides, tsunamis, river floods, winter storms and coastal phenomena, have threatened and damaged many different regions across Europe and worldwide. These events, whilst being extremely rare, can have a devastating impact on critical infrastructure systems.

The INFRARISK vision is to develop reliable stress tests to establish the resilience of critical European infrastructures to rare low frequency extreme events and to aid decision making in the long term regarding robust infrastructure development and protection of existing infrastructure.

This will be achieved through developing an operational analysis framework that considers the impact of individual hazards on specific infrastructure systems and the coupled interdependencies of critical infrastructure, addressing the complexity of Known Unknowns and Unknown Unknowns scenarios through robust risk and uncertainty modelling.

The framework will consider cascading hazards, cascading effects and time dependent vulnerability with the ultimate objective of developing practical software tools and benchmark guidelines that provide support to European infrastructure managers in assessing the probability of occurrence of extreme rare events and assessing the vulnerability of critical infrastructure. This will enable infrastructure managers to minimise the impact of extreme events by providing them with the necessary tools to develop robust mitigation and response strategies.

INFRASRISK will establish a means of cross-European collaboration, supported by the necessary tools and methodologies, where relevant stakeholders can share data, results of model simulations, and environmental services in a seamless, efficient, and effective way.

The objectives of INFRARISK will be achieved through a carefully selected consortium formed of experts in hazard identification, complex risk analysis and uncertainty modelling, operational analysis, implementation strategies, infrastructure management and engineering design and assessment.

www.infrarisk-fp7.eu

''Assessing the resilience of European Critical Infrastructure due to the occurrence of Natural Hazards events will lead to improved performance prediction of existing infrastructure while achieving more robust strategies for the development of new infrastructure.''

**Eugene O'Brien, Director,
Roughan & O'Donovan
Innovative Solutions**

Irish Contribution

Roughan & O'Donovan are coordinating the INFRARISK project through their subsidiary company and research group, Roughan & O'Donovan Innovative Solutions (ROD-IS). In addition to the administrative and financial management of the consortium and coordination of all non-technical and technical activities, tasks and deliverables, ROD-IS are also responsible for developing the fragility curves for road and rail infrastructure due to landslides and simulating the case studies which will test the applicability and validate the effectiveness of the tools and methodologies developed within the project. These case studies will incorporate the overarching risk assessment process and stress testing procedures developed to assess the resilience of European Critical Infrastructure when impacted by seismic, landslide or flood hazard. Gavin & Doherty Geosolutions (GDG) are preparing an inventory of risks to Infrastructure associated with Natural Hazards and are developing improved models for rainfall triggered landslides and earthquake triggered landslide. Triggering effects will consider the effects of Climate change on the occurrence of natural hazards.

Project Partners

- ✓ **Roughan & O'Donovan Limited (Ireland)**
- Eidgenössische Technische Hochschule Zurich (Switzerland)
- Dragados S.A (Spain)
- ⇒ **Gavin and Doherty Geosolutions Ltd (Ireland)**
- Probabilistic Solutions Consult and Training (The Netherlands)
- Agencia Estatal Consejo Superior De Investigaciones Científicas (Spain)
- University College London (United Kingdom)
- PSJ Advies (Netherlands)
- Stiftelsen SINTEF (Norway)
- Ritchey Consulting AB (Sweden)
- University of Southampton IT Innovation Centre (United Kingdom)

Project Details

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