



## 1 Editorial

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Dear readers,

We are pleased to present you the first newsletter of the **INFRARISK** project. The newsletter will share information about the progress, achievements, and activities related to the development of novel indicators for identifying critical infrastructure at risk from natural hazards.

This first issue of the **INFRARISK** newsletter presents an introductory interview with our coordinator E. O'Brien and members of the Consortium.

In subsequent sections of this first newsletter, we will introduce the project and its objectives, current activities and progress.

The newsletter ends with an overview of project outputs and publications.

Please feel invited to visit our website, which gives further details on the **INFRARISK** project. Via the website you will be able to access further details and more in-depth information about project results, materials, publications and all finalized public deliverables.

The newsletter will be distributed through our network that reaches a broad target audience including critical infrastructure practitioners, researchers, policy-makers and

the media.

However, we always appreciate it if you forward our newsletter to interested colleagues. If you do not yet receive our newsletter automatically and are interested, visit our home-page [infrarisk-fp7.eu](http://infrarisk-fp7.eu) where you can subscribe.

The newsletter will be used as a communication tool for dissemination of progress and results of **INFRARISK** to interested parties to keep them informed of all planned activities and recent news.

We hope you enjoy reading the newsletter and find the information provided interesting!

*The **INFRARISK** Team*

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## 2 Interview with INFRARISK coordinator Prof. E. O' Brien and members of the Consortium

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**Interviewer: Why is *INFRARISK* necessary to achieve the European Union targets regarding energy and socio-economic sustainability?**

*The achievements of the European Union targets are highly dependent on the way risks and vulnerabilities of European operating infrastructure networks and critical assets are minimized against natural extreme events. In Europe, extreme events are not frequent but just one in any part of Europe can have a devastating impact in our critical infrastructure systems due to the complex interdependencies.*

***INFRARISK* will develop reliable stress tests on European Critical Infrastructure. Does this mean that current stress tests are not reliable or that we need to harmonize them in the EU?**

*INFRARISK will develop new stress tests methodologies for critical infrastructure. We intend to investigate how the network will respond to a extreme loading, which is the principle of stress tests. We increase the load on the system and we will investigate how the system will behave and fail given a extreme load. We also intend to harmonize different stress tests that are now applied by the different European countries individually.*

**What kind of critical infrastructures are evaluated in the project?**

*We are focusing on transportation infrastructure, such as the TEN-T, the Trans-European road and rail infrastructure.*

***INFRARISK* will lead to better protection of existing infrastructure while achieving more robust strategies for the development of new ones.**

**What kind of rare events or low probability extreme events are considered in *INFRARISK*?**

*We will consider extreme natural hazard events such as earthquakes, landslides, and flooding.*



*INFRARISK* project coordinator Prof. O'Brien is Director and Chairman of the Board of Roughan & O'Donovan's Innovative Solutions Subsidiary (ROD/RODIS).

*These events have threatened and damaged many different regions worldwide and across Europe.*

**Are rare events related with climate change and is climate change considered in this project?**

*Many of the events identified have triggers linked to climate, e.g. flooding causing damage to coastal cities, heavy rainfall causing landslides, etc.*

*The potential for climate change to increase the frequency of triggering events will be considered. For critical infrastructure in Europe, we will identify the risks posed by natural hazard events considering the geographical correlation between elements of critical infrastructure and extreme natural hazard events and estimate possible effects of climate change on the occurrence of natural hazards.*

***INFRARISK* takes into account very different aspects related with natural hazards and its**

**impact on infrastructure. Which is the scientific background of the members of the consortium?**

We are a multidisciplinary team of engineers, mathematicians, physicists, and social anthropologists. Working together we can quantify risk and we can plan mitigation methods.

**How will you perform simulations of the consequences of a natural disaster on a critical infrastructure?**

Using our methodologies, we will be able to model, and to show on a screen, for example, both the landscape surrounding a road network including the slopes of the land and the type of vegetation, and the objects in the road network, such as the open road sections and the bridges. Then, by simulating rainfall, we will be able to model how the water moves across the land into rivers, how the water levels will rise in the rivers around bridges and the forces to which the bridges or the soil around the bridges will be subjected. Using this information, we will then be able to predict what will happen to the infrastructure, which parts will fail, and any knock-on effects, such as those related to traffic disruption, until the infrastructure is restored.

Such 'What-if' scenarios will help us to establish the infrastructure related risks due to natural hazards, and help those who need to deal with these situations understand the possibilities to reduce these risks.

**Will the final results of this project give us information on how to build our critical infrastructures in the future? Thanks to the new tests to be developed, could we detect that maybe some critical infrastructures should be strengthened?**

This methodology is going to allow infrastructure managers to evaluate their initial concept, and then carry out tests on different ways they can strength it or build it differently so the risk can be minimized.



INFRARISK 6M Progress Meeting at UCL in London

**Will the information and outcomes of INFRARISK be available for professionals and managers of critical infrastructures?**

We will deliver a collaborative integrated platform where risk management professionals access and share data, information and risk scenario results efficiently and intuitively.

INFRARISK will also formulate a training programme and further educational course to make the results of the project available for relevant organizations and authorities working in the area of the critical infrastructures.

**How can next generation benefit from the results of this project?**

We will develop an operational framework with cascading hazards, cascading impacts and dependent geospatial vulnerabilities. This framework will be a central driver to practical software tools and guidelines that provide greater support to the next generation of European Critical Infrastructure managers to analyze and handle extreme event scenarios. The minimization of the impact of such events by the supporting tools shall establish optimum mitigation measures and rapid response.

### 3 The INFRARISK project

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The significant social and economic losses in Europe as a result of natural disasters require effective disaster risk reduction and adaptation policies. Despite considerable efforts made hitherto on increasing knowledge on natural hazards and on vulnerability assessment in recent decades, human and economic losses due to disasters continue to increase and the risk from natural hazards is projected in the future to further increase in many regions due to a series of processes. Among these, an on-going concentration of human activities in risk-prone areas, the projected effects of climate change, and an ageing infrastructure network.

The objective of **INFRARISK** is to develop reliable stress tests to establish the resilience of European Critical Infrastructures (CI) to rare low frequency extreme events, thus contributing to the decision making process on how to build safer in the future.

**INFRARISK** will focus on road and rail infrastructure in Europe enabling Infrastructure managers to minimise the impact of extreme events by providing them with the necessary tools to develop robust mitigation and response strategies.

### 4 Current Progress

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#### 4.1 Timeline

<b>October 2013</b>	<b>Start of INFRARISK project</b>
<b>03 - 04 October 2013</b>	<b>Kick-Off Meeting</b> held in Dublin at the offices of the project coordinator, Roughan & O' Donovan
<b>12 November 2013</b>	<b>WP Leaders/Model Workshop</b> at University College London
<b>02 - 03 December 2013</b>	<b>General Morphological Analysis (GMA) Workshop No.1</b> in Dublin at the offices of the project coordinator, Roughan & O' Donovan
<b>26 - 27 February 2014</b>	<b>General Morphological Analysis Workshop No.2</b> in Dublin at the offices of the project coordinator, Roughan & O' Donovan
<b>19 March 2014</b>	<b>Advisory Board Meeting No.1</b> in Dublin at the offices of the project coordinator, Roughan & O' Donovan
<b>26 - 27 March 2014</b>	<b>Six Month Progress Meeting</b> at University College London
<b>29 April 2014</b>	<b>INFRARISK website</b> went online
<b>April - June 2014</b>	<b>Harmonisation Workshops</b> hosted at ETHZ in Zurich (Three separate workshops to facilitate the development of the overarching methodology and the INFRARISK Decision Support Tool (IDST))
<b>May 2014</b>	<b>Detailed Dissemination Plan</b>
<b>30 June 2014</b>	<b>Case Studies Workshop</b> hosted at ETHZ in Zürich

## 4.2 INFRARISK dissemination

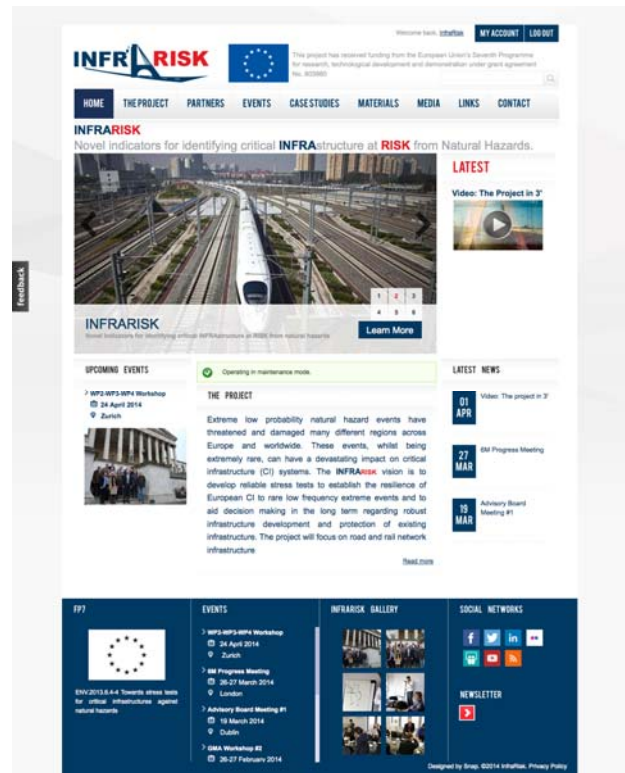
Since the project began in October 2013 a detailed Dissemination and Communication Plan, the project's corporate identity, a website, and dissemination materials such as the video "The project in 3' " and a project brochure have been developed with an on-going effort on all dissemination aspects.

The **INFRARISK** website incorporates all public information created by the Project. The dissemination team regularly posts the latest news, highlights, etc., promoting the activities and results of the project and hosting audiovisual materials.

Visit the website:  
[www.infrarisk-fp7.eu](http://www.infrarisk-fp7.eu)

Follow on Twitter:  
[@InfraRisk](https://twitter.com/InfraRisk)

Sign-up to receive the newsletter:  
[info@infrarisk-fp7.eu](mailto:info@infrarisk-fp7.eu)



Screenshot **INFRARISK** website

## 4.3 Project Management

INFRARISK organized its Kick-off meeting on the 3rd-4th October 2013 in Dublin at the offices of Roughan & O' Donovan. Twenty one persons, representing the eleven partners in the consortium attended the meeting. During the meeting administrative and management aspects of the project were discussed and an overview of each work package was presented by the work package leaders. On the second day, the meeting centred on round table discussions of the technical aspects of each work package, including a presentation on the General Morphological Analysis (GMA) method.

The 6M progress meeting on the 26th-27th March 2014 took place at University College London. WP leaders presented an update on

their progress and this was followed by open discussions among all partners on the material presented.



Kick-off meeting in Dublin, 03-04 October 2014

## 5 Project outputs and publications

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### 5.1 Public project reports and INFRARISK publications

INFRARISK (2014) *D1.1 Gender Survey*

Mark Tucker

Roughan & O'Donovan Limited (ROD)

<http://www.infrarisk-fp7.eu/deliverables>

INFRARISK (2014) *D1.2 Meetings with the Advisory Board*

Mark Tucker

Roughan & O'Donovan Limited (ROD)

<http://www.infrarisk-fp7.eu/deliverables>

INFRARISK (2014) *D1.3 Meetings of the Steering Committee*

Mark Tucker

Roughan & O'Donovan Limited (ROD)

<http://www.infrarisk-fp7.eu/deliverables>

INFRARISK (2014) *D4.1 Preliminary Model, Methodology and Information Exchange*

Bryan Adey, Jürgen Hackl, Magnus Heitzler and Ionut Iosifescu

Eidgenössische Technische Hochschule Zürich (ETHZ)

<http://www.infrarisk-fp7.eu/deliverables>

INFRARISK (2014) *D6.1 Stress Test Methodologies*

Yuliya Avdeeva and Pieter van Gelder

Probabilistic Solutions Consult and Training BV (PSCT)

<http://www.infrarisk-fp7.eu/deliverables>

INFRARISK (2014) *D8.1 Critical Infrastructure Case Studies*

Mairead Ni Choine and Karlo Martinovic

Roughan & O' Donovan Limited (ROD) /Gavin Doherty Geo Solutions (GDG)

<http://www.infrarisk-fp7.eu/deliverables>

### 5.2 References in articles

*Disaster tests for grids, dams and power plants?*

Rex Merrifield

HORIZON, The EU Research & Innovation Magazine,

28 March 2014

[http://horizon-magazine.eu/article/disaster-tests-grids-dams-and-power-plants\\_en.html](http://horizon-magazine.eu/article/disaster-tests-grids-dams-and-power-plants_en.html)

### 5.3 Contributions to Conferences (abstracts, posters)

M. Tucker (2014) *"Novel indicators for identifying critical INFRAstructure at RISK from natural hazards"*

Session: reFINE: research for Future Infrastructure Networks in Europe

ECTP-E2BA CONFERENCE, BRUSSELS, 17-19 June 2014

<http://www.infrarisk-fp7.eu/material-conference-abstracts>

E. O'Brien, K. Gavin, D. D'Ayala, B. Adey, T. Cheng, P. van Gelder, Z. Sabeur, A. O'Connor and M.J. Jimenez (2014) *"Novel Indicators for Identifying Critical Infrastructure at Risk from Natural Hazards"*

5th International Disaster and Risk Conference, IDRC, Davos, Switzerland, August 24-28, 2014

<http://www.infrarisk-fp7.eu/material-conference-abstracts>

E. O'Brien and INFRARISK Consortium (2014) *"Novel Indicators for Identifying Critical Infrastructure at Risk from Natural Hazards"*

2nd European Conference on Earthquake Engineering and Seismology, 24-29 August 2014, Istanbul, Turkey.

<http://www.infrarisk-fp7.eu/material-conference-abstracts>

P. Gehl, K. Taaleb, D. D'Ayala and T. Cheng (2014) *"Developing fragility functions for Roadway bridges using system reliability and support vector machine"*

2nd European Conference on Earthquake Engineering and Seismology, 24-29 August 2014, Istanbul, Turkey.

<http://www.infrarisk-fp7.eu/material-conference-abstracts>

### 5.4 INFRARISK Brochure

INFRARISK (2014) *Brochure 1*

M.J. Jimenez & M. Garcia-Fernández (CSIC)

<http://www.infrarisk-fp7.eu/materials-brochure>

## 6 INFRARISK key facts

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**Project acronym:** INFRARISK

**Project full title:** "Novel Indicators for identifying critical INFRAstructure at RISK from natural hazards"

**Project duration:** 03.10.2013 – 02.10.2016

**FP7 Grant Agreement no.:** 603960

**Participating countries:** Ireland, Switzerland, Spain, United Kingdom, The Netherlands, Norway, Sweden

## 6 INFRARISK partners

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