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DELIVERABLE

**PROJECT INFORMATION**

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## **Abstract**

The present deliverable contains the detailed dissemination and exploitation plan of the project results, with particular emphasis on communicating to stakeholders and user communities, addressing the outcomes of STREST on the enhancement of societal resilience through infrastructure stress tests. This deliverable presents the objectives of the dissemination activities, the identification of stakeholders and the detailed description of tasks concerning the use and dissemination of the STREST project foreground.



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## 1. Introduction

Critical Infrastructures (CIs) provide essential goods and services for modern society; they are highly integrated and have growing mutual dependencies. Recent natural events have shown that cascading failures of CIs have the potential for multi-infrastructure collapse and widespread societal and economic consequences. Among the most important assessment tools are the stress tests, designed to test the vulnerability and resilience of individual CIs and infrastructure systems.

The STREST project aims at developing a stress test framework to determine the vulnerability and resilience of critical infrastructures. STREST will establish a common and consistent taxonomy of CIs; develop a rigorous, consistent modelling approach to hazard, vulnerability, risk and resilience assessment of low probability-high consequence events; design a stress test framework and specific applications to address the vulnerability, resilience and interdependencies of CIs.

STREST will focus on earthquakes, tsunamis, geotechnical effects and floods, and on three principal CI classes chosen to typify general classes of CIs, with the final goal of enabling the implementation of European policies<sup>1,2,3,4,5,6,7</sup> for the systematic implementation of stress tests.

The present deliverable contains the detailed dissemination and exploitation plan of the project results, with particular emphasis in communicating to stakeholders and user communities, addressing the outcomes of STREST on the enhancement of societal resilience through infrastructure stress tests. This deliverable presents the objectives of the dissemination activities, the identification of stakeholders and the detailed description of performed and planned tasks concerning the use and dissemination of the project foreground.

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<sup>1</sup> Council Directive 2008/114/EC on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection

<sup>2</sup> Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances

<sup>3</sup> Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

<sup>4</sup> A European programme for critical infrastructure protection. Communication from the Commission COM(2006) 786 final

<sup>5</sup> The review of the European programme for critical infrastructure protection (EPCIP). Commission staff working document SWD(2012) 190 final EC (2010a)

<sup>6</sup> The EU Internal Security Strategy in Action: Five steps towards a more secure Europe. Communication from the Commission to the European Parliament and the Council COM(2010) 0673 final

<sup>7</sup> Risk assessment and mapping guidelines for disaster management. Commission staff working paper SEC(2010) 1626 final



## 2. Objectives and stakeholders for dissemination

### 2.1 Objectives

The dissemination work package of STREST focuses on transforming the results and new methodologies developed by the project in protocols and reference guidelines for the wider application of stress tests, and their dissemination to the wider community. The dissemination activities aim at communicating to regulators and operators of non-nuclear critical infrastructures of the products developed during the project, namely harmonized methodologies for risk assessment leading to the standardization and implementation in Europe of stress tests methodologies for main classes of infrastructures against natural hazards. The critical infrastructures of interest include gas and electricity networks, transportation networks, petrochemical plants, and in general all high risk and high economic and environmental impact infrastructures.

Overall, the dissemination activities will have an impact on the society at large, by incorporating stress test methodologies in current management and long-term planning of non-nuclear critical infrastructures, in line with the European policies for disaster management and the protection of critical infrastructures, and ultimately by the enhancement of societal resilience.

The direct participation of a broad range of CIs and industry representatives – including plant owners and operators, consultants, regulators and industry associations – will ensure the relevance of the products and outcomes, and the organization of stakeholders meetings will ensure the dissemination to the wider community.

The networking with key organizations and programs in the US, Asia and Japan will ensure the international context, harmonization and knowledge transfer for the development of true novel standards.

The main objectives of the STREST plan for the use and dissemination of foreground are:

- Preparation of technical guidelines and recommendations in the form of Reference Reports;
- Transfer of knowledge and lessons learned from previous events and research projects;
- Dissemination of products from research (harmonized hazard and risk assessment for extreme natural events, vulnerability models for performance and consequences assessment, stress tests methodologies and protocols);
- Demonstration activities (exploratory applications of the stress test concepts);
- Involvement of stakeholders and user communities.

Fig. 2.1 presents a graphical representation of the STREST dissemination scheme. Dissemination is carried out through a dedicated web server and by the organization of workshops. Leaflets, newsletters, and other awareness material, such as booklets, multi-media, brochures and publications will be produced as part of the dissemination activities.

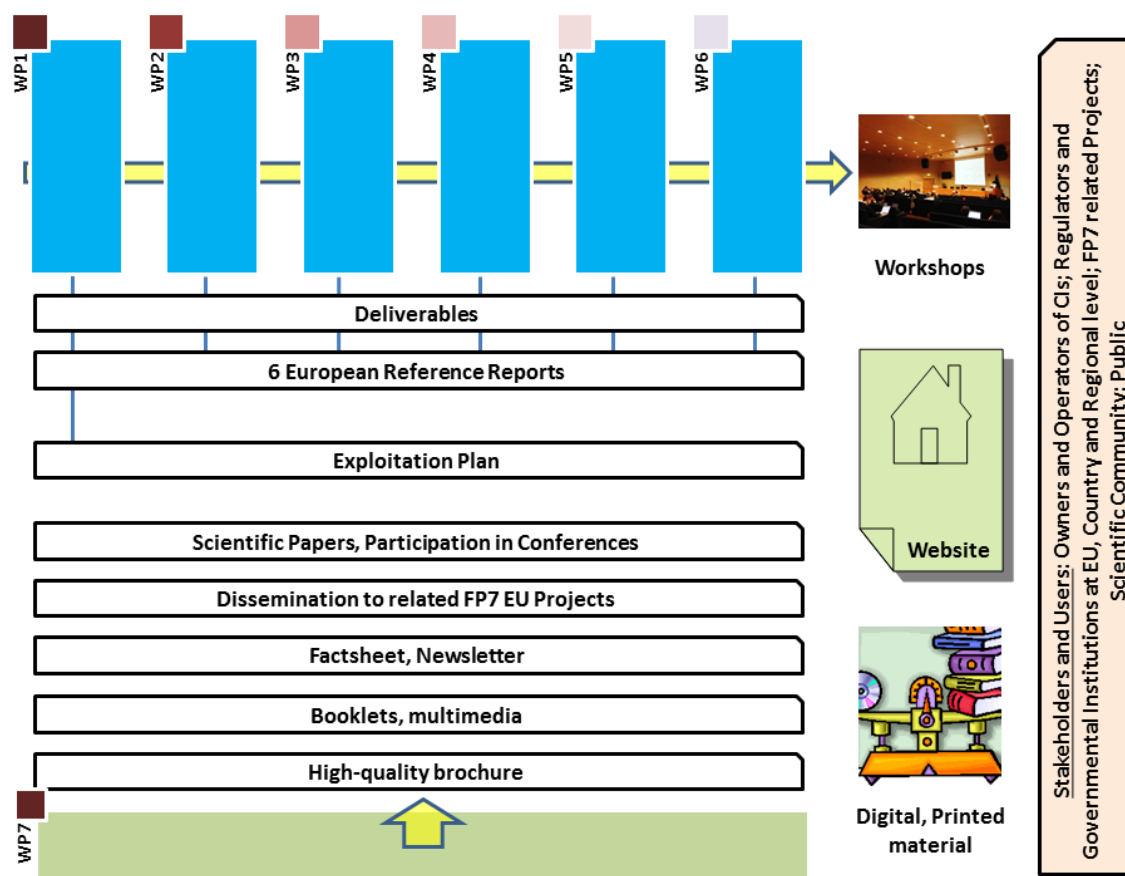


Fig. 2.1 Graphical representation of STREST dissemination scheme

## 2.2 Stakeholders

The STREST project has identified groups of stakeholders including owners and operators of critical infrastructures, authorities and regulators, the scientific and technical community, public administration (local, national and European) and Civil Protection. Specific groups are actively involved in different phases of the project; in particular, the International Advisory Board is made up of members of the scientific community and the Board of Associated Industry Partners includes representatives of owners, regulators and operators of a diverse set of non-nuclear critical infrastructures. A list of European regulators is also identified. Furthermore, the scientific and technical community is involved through contacts with European research projects relevant to STREST.

### 2.2.1 International Advisory Board

The International Advisory Board (IAB) consists of five prominent, internationally recognized experts in the field. Besides the advisory role, the purpose of this committee is also to foster further international cooperation and dissemination of results and knowledge, and to coordinate the STREST work with other international research activities in the fields of research represented in the project. The IAB is informed regularly of the results of the STREST project research and is invited to project meetings.

STREST invited to the IAB a number of leading experts and program coordinators from key research institutions around the world (outside Europe):

- Prof Dr Thomas H. Heaton, Director of the Earthquake Engineering Research Laboratory, California Institute of Technology, USA, expert in strong ground motion research, earthquake rupture physics, early warning systems and analysis of building vibrations;
- Prof Dr Stephen A. Mahin, Byron L. and Elvira E. Nishkian Professor of Structural Engineering and Director of the Pacific Earthquake Engineering Research (PEER) Center, University of California Berkeley, USA, expert in performance-based engineering of structures;
- Prof Dr Tso-Chien Pan, Executive Director of the Institute of Catastrophe Risk Management, Nanyang Technological University, Singapore, expert in damage assessment of buildings subjected to dynamic loading, structural design for blast loading, vulnerability and risk assessments;

### **2.2.2 Associated Industry Partners**

The Board of Associated Industry Partners (BAIP) is formed of a representative of each critical infrastructure considered in the project. Its role is to provide data and recommendations for the application of the methods developed in the STREST project to the selected application sites but also to participate in the realisation of specific tasks. The identified STREST Associated Industry Partners combine different and complementary profiles and build a coherent expertise and stakeholder representation, from plant owners and operators to consultants to regulators and industrial associations:

- CNR and AMRA, risk consultants for the ENI/Kuwait Milazzo petrochemical plant, Italy;
- The Swiss Federal Office of Energy (SFOE), regulator for the Valais dams of Switzerland (CI-A2);
- BOTAS International Ltd., operator of the Baku-Tbilisi-Ceyhan (BTC) Crude Oil Pipeline, Turkey;
- The Gasunie Transport Services, owner of the national natural gas pipeline system, the Netherlands;
- The Thessaloniki Port Authority SA (THPA SA), Greece;
- The Confindustria of Piacenza, representing all the industrial firms in the province of Piacenza, Italy.

This unique combination of expertise, knowledge and interests strengthens the industry participation in STREST.

### **2.2.3 European associations of regulators**

In addition to the associated industry partners already participating in the project, STREST will seek the participation of owners and operators, as well as of regulatory authorities at European and international level dealing with non-nuclear critical infrastructures, such as the:

- Council of European Energy Regulators (CEER);
- Agency for the Cooperation of Energy Regulators (ACER);
- European Network of Transmission System Operators for Electricity (ENTSO-E);
- European Network of Transmission System Operators for Gas (ENTSO-G);
- European Chemical Industry Council (CEFIC);
- European Sea Ports Organisation (ESPO);

- International Commission on Large Dams (ICOLD).

### 2.2.4 European research projects

The STREST project is relevant to a number of projects from the European Union's Seventh Framework Programme from the energy, environment, infrastructure and security themes, as listed in Table 2.1 together with the issues dealt with by each project. The communication and knowledge transfer between parallel on-going projects is facilitated through several of the STREST partners that participate in other projects and by mutual participation in dissemination events.

Table 2.1 List of selected FP7 projects relevant to STREST

<b>Acronym</b>	<b>Duration</b>	<b>Website</b>	<b>Keywords</b>
ASTARTE	2013-2016	astarte-project.eu	tsunami, coastal impacts, structural performance, social resilience
GEISER	2010-2013	geiser-fp7.fr	induced seismicity, hazard, uncertainties
INFRARISK	2013-2016	infrarisk-fp7.eu	earthquake, flood, landslide, drought hazards, LP-HC events, uncertainties, cascades, operational analysis
INTACT	2014-2017	intact-project.eu	extreme weather, critical infrastructures, resilience
MATRIX	2010-2013	matrix.gpi.kit.edu	multi-hazard, multi-risk, LP-HC events, cascades, time-variant vulnerability
NERA	2010-2014	nera-eu.org	earthquake risk, earthquake risk mitigation
REAKT	2011-2014	reaktproject.eu	real-time earthquake risk mitigation
SHARE	2009-2012	share-eu.org	seismic hazard
SYNER-G	2009-2012	vce.at/SYNER-G	earthquakes, systemic vulnerability, socio-economic vulnerability



### 3. Dissemination and exploitation activities

#### 3.1 Dissemination of project results

The dissemination activities aim at communicating to regulators and operators of non-nuclear critical infrastructures the products developed during the STREST project. In particular, the dissemination activities consist of the following tasks:

- Development of the project web server (website, document archive and exchange platform with public and restricted parts)
- Preparation of dissemination material in the form of newsletters, brochures, leaflets and multi-media material;
- Preparation of a set of technical guidelines, policy briefs and recommendations in the form of Reference Reports concerning the assessment and protection of CIs;
- Publication of peer-reviewed articles;
- Dissemination in the media;
- Participation in key international scientific events;
- Interaction with similar research projects for exchange of knowledge and planning common actions;
- Organization of workshops with emphasis on the participation of European and international stakeholders to collect their user requirements and to communicate the results of the project.

#### 3.2 Project website

The project website ([www.strest-eu.org](http://www.strest-eu.org)) provides information to the public about the STREST project. It is the principal platform for communication, public awareness and dissemination of results. The public website (Fig. 3.1), developed and hosted by ETH Zurich, was designed for an easy navigation through a simple one-level menu and for immediate impact via animations and a bullet point approach. The restricted part of the website is accessible to STREST participants only, with a login and password required. It is the exchange platform of STREST with upload/download options in a folder-based architecture, also hosted by ETH Zurich (<http://dms.seismo.ethz.ch/>).

The screenshot shows the STREST homepage with the following elements:

- Header:** STREST logo and tagline "Harmonized approach to stress tests for critical infrastructures against natural hazards". Navigation links: HOME | METHODS | RESULTS | CONSORTIUM | LOGIN.
- Main Navigation:** Critical Infrastructures | STREST at a glance.
- Featured Image:** "Switzerland Large dams" with left and right navigation arrows.
- Sub-headers:** "The Challenge", "Objectives", "Methods", "Expected Results", "STREST in Numbers".
- Text Block:** "Critical Infrastructures (CIs) provide essential goods and services for modern society; they are highly integrated and have growing mutual dependencies. Recent natural events have shown that cascading failures of CIs have the potential for multi-infrastructure collapse and widespread societal and economic consequences. Moving toward a safer and more resilient society requires improved and standardized tools for hazard and risk assessment of low probability-high consequence (LP-HC) events, and their systematic application to whole classes of CIs, targeting integrated risk mitigation strategies. Among the most important assessment tools are the stress tests, designed to test the vulnerability and resilience of individual CIs and infrastructure systems. Following the results of the stress tests recently performed by the EC for the European Nuclear Power Plants, it is urgent to carry out appropriate stress tests for all other classes of CIs."
- Upcoming events:** 14-15 September 2015: STREST Final Meeting, Ljubljana.
- Past events:** 12-13 October 2015: STREST 2nd Year Workshop, Thessaloniki; 22 May 2015: WP5 workshop, Zurich.
- Latest News:** "In the Media" section with a link to "XL Group (2015), Redefining Risk for Critical Infrastructure: Q&A with EU STREST Coordinator, Professor Domenico Giardini [LINK]"; "WP2 Update" section with a link to "The final results from WP2 'State-of-the-art and lessons learned' are now available in the Results section of the STREST website:".
- WP2 Update List:**
  - D2.1: Report summarizing the analysis and systematic classification of the results from hazard assessment and stress tests for WP2s;
  - D2.2: Report on state-of-the-art in hazard assessment and stress tests for non-nuclear CIs;
  - D2.3: Report on lessons learned from recent catastrophic events;
  - D2.4: Report on lessons learned from on-going and completed EU projects

Fig. 3.1 STREST homepage with list of events, news and access to different sections of the website

The Results section of the website lists the deliverables, peer-reviewed articles, proceedings papers and media articles about STREST. All published deliverables are available for download, as well as other publications that are not covered by copyright restrictions.

It is intended to maintain the website beyond the end of the project for a sustained dissemination of the results.

### 3.3 Dissemination material

The awareness and dissemination material planned for the STREST project comprise a set of newsletters, a high-quality brochure, an informational factsheet and a short video targeting a wide public audience.

Two newsletters were published in December 2014 and June 2015. The first one, shown in Fig. 3.2, gives the list of the main past and forthcoming events and focuses on the scientific and technical work of the project. The second newsletter, shown in Fig. 3.3, briefly presents the scientific and technical achievements at the project mid-term, summarises the discussions and conclusions of the first workshop and presents the next steps and events. The last one will be published near the end of the project and it will include the announcement and plan for the final dissemination workshop, the number of scientific papers published within STREST, the preparation of a Euronews documentary on STREST and selected results from the case studies.

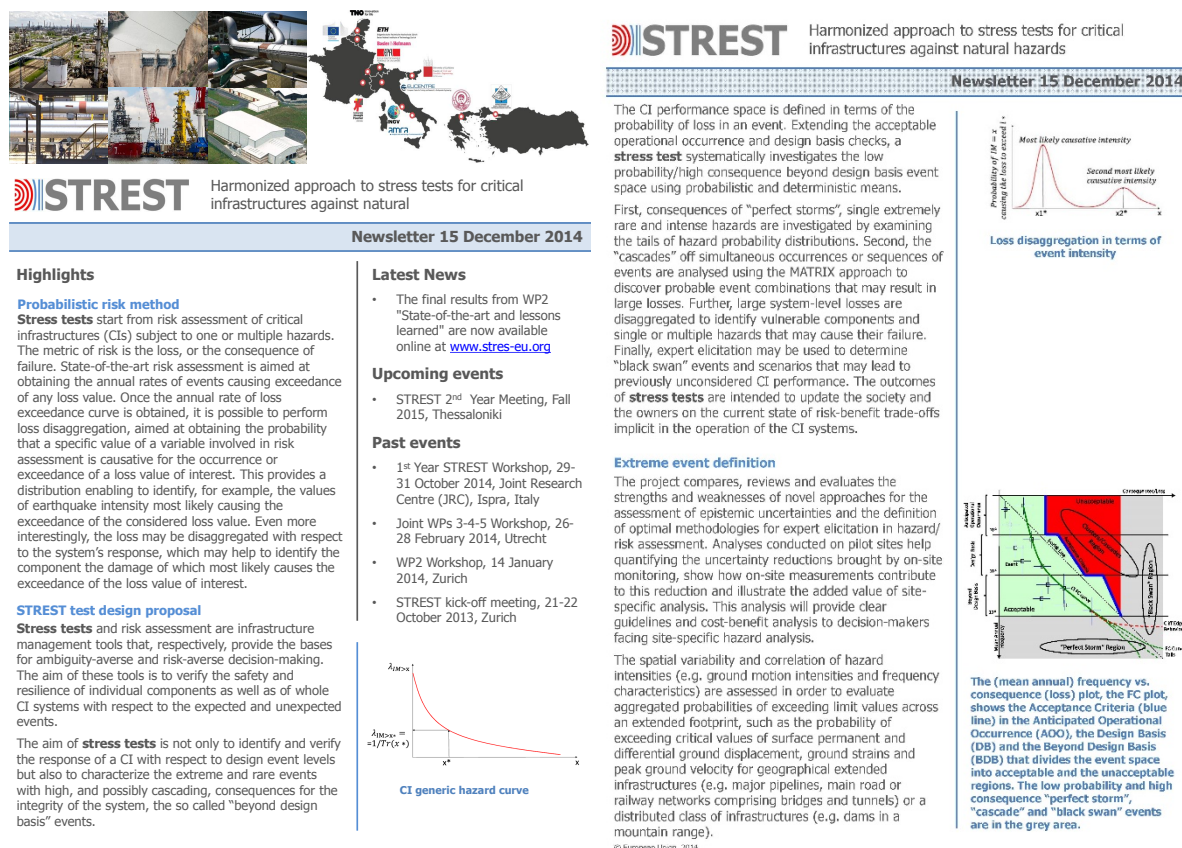


Fig. 3.2 First project newsletter (15 December 2014)



Fig. 3.3 Second project newsletter (15 June 2015)

A two-page project fact sheet was produced at the beginning of the project to provide general information about STREST and the list of partners. It gives an overview of the project, including objectives, methodology and expected results.

### 3.4 Reference reports

STREST will produce an integrated set of technical guidelines and recommendations concerning the assessment and protection of critical infrastructures, derived from the main deliverables of its work packages and written specifically for end-users, regulators and plant operators not included in STREST. Activities of this task will include the preparation of a consolidated list of reports, issuing of the guidelines for writing, drafting, reviewing and production of the final version of the reports.

The six reports are listed in Table 3.1 together with the contributors, lead editors and reviewers. The first one will present the state-of-the-art and lessons learned. The following four will focus on harmonised guidelines based on the research results of the STREST project and in detail on hazard assessment for high consequences events, vulnerability and risk assessment, stress-test design and enhancement of societal resilience through infrastructure stress tests. The last reference report will be a policy brief in relation to European policy developments on extreme events with potential impact on non-nuclear critical infrastructures.

Each report is addressed to specific groups of stakeholders, including – but not limited to – owners and operators of critical infrastructures (OO), authorities and regulators, scientific community (SC), technical community (TC), public European and national administration (PA) and Civil Protection (CP).

Table 3.1 STREST Reference reports

Report title	Contributors	Lead editors	Reviewer	Audience
1 State-of-the-art and lessons learned from advanced safety studies and stress-tests for critical infrastructures	ETH Zurich, EPFL, BUH, EUCENTRE, AMRA, TNO, UJF, AUTH, BU, UL, JRC	G. Tsionis (JRC), P. Zwicky (BUH)	J. Selva (INGV)	OO, AR, SC, TC, CP
2 Guidelines for harmonized hazard assessment for high-consequences events	ETH Zurich, EPFL, EUCENTRE, AMRA, INGV, TNO, UJF, AUTH, BU	F. Cotton (UJF)	G. Weatherill (EUCENTRE)	OO, AR, SC, TC, CP
3 Guidelines for harmonized vulnerability and risk assessment for non-nuclear critical infrastructures	ETH Zurich, EPFL, EUCENTRE, AMRA, INGV, TNO, UJF, AUTH, BU, UL, JRC	I. Iervolino (AMRA)	M. Spruijt (TNO)	OO, AR, SC, TC, CP
4 Guidelines for stress-test design for non-nuclear critical infrastructures and systems	ETH Zurich, EPFL, EUCENTRE, AMRA, INGV, TNO, UJF, AUTH, BU, UL	K. Pitolakis (AUTH)	A. Schleiss (EPFL)	OO, AR, SC, TC, PA, CP
5 Strategies for enhancement of societal resilience through infrastructure stress-tests	EPFL, EUCENTRE, AMRA, TNO, AUTH, BU	B. Stojadinovic (ETH Zurich), H. Crowley (EUCENTRE)	M. Dolsek (UL)	OO, AR, PA, CP
6 STREST Policy Brief: Coping with extreme events potentially impacting non-nuclear critical infrastructures	ETH Zurich, EUCENTRE, AMRA, TNO, UJF, AUTH, JRC	G. Tsionis (JRC), A. Mignan (ETH Zurich)	M. Erdik (BU)	OO, AR, PA, CP

The complete set of reference reports will be made available both in printed version for distribution to key stakeholders and participants of the final workshop and on digital format to be downloaded from the project website, the JRC Science Hub (<https://ec.europa.eu/jrc>) and other local websites of the project partners. As EU publications, the reference reports will be also available from the EU Bookshop (<http://bookshop.europa.eu>).

### 3.5 Scientific publications

Aiming at the dissemination of the research results produced within STREST, peer-reviewed papers will be published in scientific journals and conference proceedings. The papers published in the first two and a half years of the project duration are listed below:

- Babič, A. and M. Dolšek (2014), The impact of structural components on fragility curves of single-storey industrial precast structures, Proceedings of the 2nd European Conference on Earthquake Engineering and Seismology, Istanbul, 24-29 August
- Casotto, C., V. Silva, H. Crowley, R. Nascimbene and R. Pinho (2014), Scenario damage analysis of RC precast industrial structures in Tuscany, Italy, Proceedings of the 2nd European Conference on Earthquake Engineering and Seismology, Istanbul, 24-29 August
- Akkar, S. and Y. Cheng (2015), Application of Monte-Carlo simulation approach for the probabilistic assessment of seismic hazard for geographically distributed portfolio, Earthquake Engineering and Structural Dynamics, doi: 10.1002/eqe.2667
- Casotto, C., V. Silva, H. Crowley, R. Nascimbene and R. Pinho (2015), Seismic fragility of Italian RC precast industrial structures, Engineering Structures, 94, 122-136, doi: 10.1016/j.engstruct.2015.02.034
- Iervolino, I., M. Giorgio and E. Chioccarelli (2015), Markovian modeling of seismic damage accumulation, Earthquake Engineering & Structural Dynamics, doi: 10.1002/eqe.2668
- Lanzano, G., F. Santucci de Magistris, G. Fabbrocino and E. Salzano (2015), Seismic damage to pipelines in the framework of Na-Tech risk assessment, J. Loss Prevention in the Process Industries, 33, 159-172, doi: 10.1016/j.jlp.2014.12.006
- Marzocchi, W., M. Taroni and J. Selva (2015), Accounting for Epistemic Uncertainty in PSHA: Logic Tree and Ensemble Modeling, Bull. Seismol. Soc. Am., 105, doi: 10.1785/0120140131
- Matos, J. P., A. Mignan and A. J. Schleiss (2015), Vulnerability of large dams considering hazard interactions: conceptual application of the Generic Multi-Risk framework, Proceedings of the 13th ICOLD International Benchmark Workshop on Numerical Analysis of Dams, Lausanne, Switzerland
- Mignan, A., L. Danciu and D. Giardini (2015), Reassessment of the Maximum Fault Rupture Length of Strike-Slip Earthquakes and Inference on Mmax in the Anatolian Peninsula, Turkey, Seismol. Res. Lett., 86, 890-900, doi: 10.1785/0220140252
- Miraglia, S., W. Courage and P. Meijers (2015), Fragility Functions for Pipeline in Liquefiable Sand: a Case Study on the Groningen Gas-Network, 12th International Conference on Applications of Statistics and Probability in Civil Engineering, ICASP12, Vancouver, Canada, July 12-15, 201
- Uckan, E., B. Akbas, J. Shen, W. Rou, F. Paolacci and M. O'Rourke (2015), A simplified analysis model for determining the seismic response of buried steel



pipes at strike-slip fault crossings, *Soil Dynamics and Earthquake Engineering*, 75, 55-65, doi: 10.1016/j.soildyn.2015.03.001

- Trevlopoulos, K. and P. Guéguen (2016), Period elongation-based framework for operative assessment of the variation of seismic vulnerability of reinforced concrete buildings during aftershock sequences, *Soil Dynamics and Earthquake Engineering*, doi: 10.1016/j.soildyn.2016.02.009

More publications are expected when all work packages will be completed and beyond the end of the project. All publications do/will acknowledge the funding received from the European Community's Seventh Framework Programme.

### 3.6 Media dissemination

The dissemination plan of STREST includes activities for the presentation of the project and the research products to the non-specialised media. The following articles were published in web platforms and electronic magazines:

- Giardini, D. and A. Mignan (2014), Protecting infrastructures, *Pan European Networks: Government*, 11, pp. 234-235
- Merrifield, R. (2014), Disaster tests for grids, dams and power plants. *Horizon, The EU Research & Innovation Magazine*, 28 March 2014
- XL Group (2015), Redefining Risk for Critical Infrastructure: Q&A with EU STREST Coordinator, Professor Domenico Giardini

The STREST project will be presented in a short documentary of Euronews within its Futuris series. The documentary will show an overview of the project and its objectives, the STREST framework for stress tests and selected results of the exploratory applications on a Swiss dam and the port of Thessaloniki.

### 3.7 Conferences

The results of the project are communicated to the scientific and technical communities through the participation of STREST partners in key international scientific conferences related to the project, such as the 2<sup>nd</sup> European Conference on Earthquake Engineering and Seismology, the 34<sup>th</sup> General Assembly of the European Seismological Commission, the 12<sup>th</sup> International Conference on Computational Structures Technology, the 13<sup>th</sup> ICOLD International Benchmark Workshop on Numerical Analysis of Dams and the 12<sup>th</sup> International Conference on Applications of Statistics and Probability in Civil Engineering. The publications and papers submitted by the partners will be listed in the Results section of the STREST website.

### 3.8 Interaction with similar research projects

In addition to the associated industry partners already participating in STREST, the project seeks interactions with similar on-going research projects. Representatives of the projects listed in Table 2.1 participated at the 1st year STREST workshop that was held on 29-31 October 2014 and focused on exploring synergies between related FP7 Projects. The discussions led to the following conclusions:

1. Areas where common work would be beneficial include a common approach to uncertainty estimation, the review of 'good practice' in risk analysis, harmonization of hazard indicators and risk metrics and wider involvement of stakeholders.
2. A panel of experts (selected from the participating projects) could help making sure that the methods developed in different projects are compatible (e.g. similar

hazard indicators and risk metrics) and identify if they can be transposed to other projects for tests on additional exploratory applications (e.g. same risk analyses in different test sites being part of a same critical infrastructure taxonomy). The panel could investigate the causes of possible discrepancies between the results of different projects.

3. A coordinated support action from the European Commission would be needed to achieve results at inter-project level, such as a harmonized taxonomy across projects of critical infrastructures (e.g. combining energy networks and transportation networks) or a common method for cascade modelling (e.g. applied to both geological and hydrological hazards).

It is planned to continue the interaction through the participation in the workshops organised by other projects. STREST was invited to a number of workshops and will dedicate a session of the final project workshop to the presentation of the INFRARISK, INTACT and RAIN projects.

### **3.9 Workshops with stakeholders**

In addition to the associated industry partners already participating in STREST, the project seeks to involve relevant research projects and other stakeholders. While the first workshop was dedicated to the interaction with the research community, the final workshop will focus on the dissemination of the results obtained within STREST to the widest possible range of stakeholders, including regulators, owners and operators of non-nuclear CIs, civil protection services, and the scientific and technical community. The stakeholders identified in Section 2.2 were invited to the final workshop. The flyer announcing the workshop, its objectives and programme was distributed together with the invitation. The invitation will be extended to other stakeholders from industry and critical infrastructure operators.

The final workshop aims at communicating the products developed during the project, namely new research results on natural extreme events and harmonized methods for risk assessment leading to the standardization and implementation in Europe of stress tests for various classes of critical infrastructures. It will present the results of applications from a large selection of critical infrastructures: petrochemical plants, hydropower dams, oil pipelines, gas networks, port infrastructures and industrial districts. The main innovations presented are related to seismic hazard and risk, coastal and downstream flooding, as well as to the process of domino effects across natural hazards and critical infrastructures elements. Invited researchers from partner European projects will also present their main findings.

It will present the results of the research on extreme events, model uncertainties, site-specific effects, hazard and risk interactions and stress test methods with illustrations in six key critical infrastructures in Europe. The largest part of the workshop will be devoted to the results from the exploratory application of the STREST stress tests. With the contribution of the project partners, International Advisory Board, Associated Industry Partners, researchers from relevant on-going projects and other invited stakeholders, the workshop will propose a vision for risk management in critical infrastructures.





#### **4. Expected impact of dissemination**

The use and dissemination of foreground planned for STREST comprise the preparation of dissemination material (Reference Reports, leaflets, newsletters and multimedia), workshops, scientific publications in refereed journals, participation in international conferences and interaction with relevant projects and other stakeholders. The dissemination plan will focus on transforming the results and new methodologies developed by STREST in protocols and reference guidelines for the wider application of stress tests, and their dissemination to the wider community.

The planned activities will contribute to the dissemination of the project results and will foster the collaboration between stakeholders, towards the development and implementation of European harmonised guidelines for stress tests of non-nuclear critical infrastructures. These activities are also a key instrument for dissemination to the scientific and technical communities, as well as to policy and decision makers at European, national, regional and local levels.

The direct participation in the planned activities of a broad range of critical infrastructure and industry representatives – including plant owners and operators, consultants, regulators and industry associations – will ensure the relevance of the products and outcomes.

Overall, the dissemination activities will have an impact on the society at large, by incorporating stress test methodologies in current management and long-term planning of critical non-nuclear infrastructures.



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