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iNTeg-Risk

Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related Risks

FP7/NMP –Grant no. CP-IP 213345-2

Coordination: EU-VRi European Virtual Institute for Integrated Risk Management EEIG, A. Jovanovic
Contact: integrisk@eu-vri.eu / www.integrisk.eu-vri.eu
Start/End: Dec. 1, 2008 to May 31, 2013
Budget: ~ 19.3 million €

Partners*

Main Beneficiaries" (59, EU-VRi indicates an EU-VRi member):

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2 EU-VRi **EDF** Electricité de France, France
3 **GDF SUEZ** France
6 EU-VRi **MERL** Materials Engineering Research Lab. Ltd, UK
7 EU-VRi **TÜV** SÜD Industrie Service GmbH, Germany
9 EU-VRi **R-Tech** Steinbeis Advanced Risk Technologies GmbH, Germany
10 **Iberdrola** S.A., Spain
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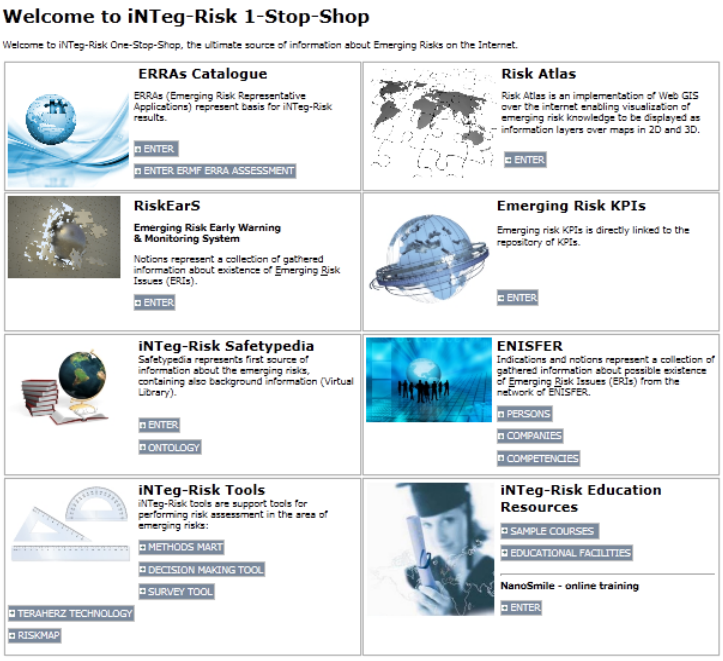
31 EU-VRi **CEA** Commissariat à l'Energie Atomique, France
32 EU-VRi **BAM** Ba. für Materialforschung und -prüfung, Germany
33 EU-VRi **USTUTT** Universität Stuttgart (ZIRN), Germany
34 EU-VRi **Tecnalia** Fundacion Tecnalia Research & Innovation, Spain
37 EU-VRi **TU Crete** Technical University of Crete, Greece
39 EU-VRi **SINTEF** Stiftelsen, Norway
40 EU-VRi **DTU** Technical University of Denmark, Denmark
41 EU-VRi **VTT** Technical Research Centre of Finland, Finland
42 EU-VRi **BZF** Bay Zoltan Foundation for Applied Research, Institute for Logistics and Production Systems, Hungary
43 EU-VRi **Demokritos** National Center for Scientific Research, Greece
44 EU-VRi **IVF** Swerea IVF AB, Sweden
45 EU-VRi **VSB-TUO** Sc. Technicka Univerzita Ostrava , Czech Republic
46 EU-VRi **JSI** Jozef Stefan Institute, Slovenia
47 **HSE-HSL** Health and Safety Executive, UK
48 EU-VRi **JRC** Commission of The European Communities Directorate General Joint Research Centre, Belgium
49 EU-VRi **CEN** European Committee for Standardization , Belgium



iNTeg-Risk Project

iNTeg-Risk is a large-scale integrating project aimed at improving the management of emerging risks, related to "new technologies" in European industry. This is being achieved by building new management paradigm for emerging risks as a set of principles supported by a common language, agreed tools & methods, and Key Performance Indicators, all integrated into a single framework. The project aim is to reduce time-to-market for the lead market EU technologies and promote safety, security, environmental friendliness and social responsibility as a trademark of the EU technologies. The project goal is to improve early recognition and monitoring of emerging risks and decrease reaction times if major accidents involving emerging risks happen.

The project involves leading EU industries and renowned R&D institutions. It is coordinated by the European Virtual Institute for Integrated Risk Management, the dedicated EEIG guaranteeing the sustainability of results after the project.

Project structure and main planned achievements

The iNTeg-Risk solution is based on the analysis of 17 individual applications of new technologies, the so-called iNTeg-Risk ERRAs - Emerging Risk Representative Applications in EU Industry, involving e.g. nanotechnologies, H_2 technologies, underground storage of CO_2, new materials. The solutions from these single applications have been generalized and have been used for the definition of the iNTeg-Risk framework.

The solution is being made available to the users in the form of the iNTeg-Risk "one-stop shop". The solution includes issues of early recognition and monitoring of emerging risks, communication, governance, pre-standardization, education & training, dissemination, as well as new tools such as Safetypedia, Atlas of Emerging Risks, Reference Library, etc.

The subprojects in iNTeg-Risk, listed below, reflect the approach described above:

Subproject 1: Technology cases - Identifying specific emerging risks and developing solutions for iNTeg-Risk framework

Subproject 2: Creating an integrated scientific & technology framework for analysis and management of emerging risks

Subproject 3: Verifying SP2 results and validating the whole method

Subproject 4: iNTeg-Risk integrated EU solution, the "iNTeg-Risk one-stop-shop" for solutions addressing emerging risks

Subproject 5: PROJECT MANAGEMENT & MORE: Managing iNTeg-Risk and creating its "post-project" infrastructure

50 **RIVM** Rijksinstituut voor Volksgezondheid en Milieu, The Netherlands
52 **vfdb** German Fire Protection Association, Germany
53 **ARPC** Agenzia Regionale Protenzione Civile - Emilia Romagna, Italy
55 **ARMINES** Association pour la Recherche et le Développement des Méthodes et Processus Industriels, France
57 **TUKE** Technical University of Kosice , Slovakia
58 **FTN** University of Novi Sad, Serbia
59 **EKON** Modeling Software Systems Ltd., Israel
62 **SP** Technical Research Institute of Sweden , Sweden
63 **STUVA** Studiengesellschaft. für unterirdische Verkehrsanlagen e. V., Germany
64 **UNIBO** Alma Mater Studiorum Università di Bologna, Italy
65 **UNIPD** University of Padua, Italy
66 **POLIMI** Politecnico di Milano, CMIC Dpt, Italy
67 **UNIRM** Dipartimento Ingegneria Chimica Materiali e Ambiente, Sapienza Università di Roma, Italy
68 **CNR-IRC** CNR Istituto di Ricerche sulla Combustione, Italy
69 **UNIPI** University of Pisa, Italy
70 **IQS**, Institut Químic de Sarrià, Spain
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72 ***Trimble**, Trimble GmbH, Germany

"Article 10 partners" (23):

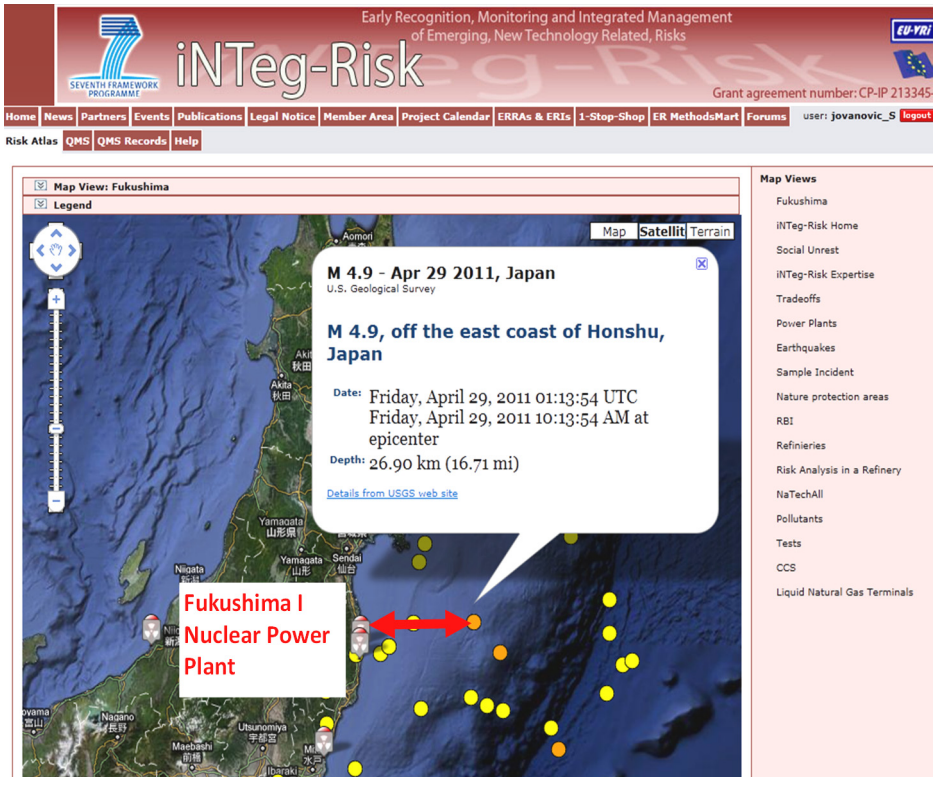
2B, 2B Consulenza Ambientale, Italy; **SHB**, Steinbeis Hochschule Berlin GmbH, Germany; **EUR**, Erasmus University Rotterdam, Netherlands; **OttoUNI**, Otto-von-Guericke-Universität Magdeburg, Germany; **BristolUNI**, University of Bristol, UK; **STC**, Steinbeis Technologie-transfer GmbH & Co. KG, Germany; **ELITE**, European Laboratory for intelligent Techniques Engineering, Germany; **DIN**, German Institute for Standardization e. V., Germany; **CrisisTox**, CrisisTox Consult, Netherlands; ***Fraunhofer**, Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V., Germany, ***BlueOcean**, Blue Ocean Semantic Web Solutions GmbH, Switzerland, ***Expert System**, Expert System S.P.A., Italy, ***Allianz**, Allianz Global Corporate & Specialty AG, Germany, IRGC, International Risk Governance Council, Switzerland; ***IRGC**, International Risk Governance Council, Switzerland; ***AXA**, GIE AXA, France; ***OECD**, Organization for Economic Co-operation and Development, France; ***ALTRAN**, Altran B.V., Netherlands, **IMIM**, Institute of Metallurgy and Materials of Polish Academy of Sciences, Poland; **IPPT**, Instytut Podstawowych Problemow Techniki Polskiej Akademii Nauk, Poland; **IMR SAS**, Institute of materials research, Slovak Academy of Sciences, Slovakia; **MCL**, Materials Centre Leoben Forschung GmbH, Austria; **UK HPA**, UK Health Protection Agency, UK; **FOI**, Swedish Defense Research Agency, Sweden; **FIOH**, Finnish Institute of Occupational Health, Finland; **BfR**, Bundesinstitut für Risikobewertung, Germany; **ENSMP**, Ecole Nationale Supérieure des Mines de Paris, France, ***Swissi España**, Instituto Suizo para el fomento de la seguridad-Swissi España, S.L.U., Spain
* - new members acc. to Amendment No. 4 to the GA 213345

Main achievements as in September 2011

In spring 2011 the project entered the second half of its planned duration. This has been marked by the following main results achieved:

- All 17 ERRAs accomplished and consolidation of their results started
- More than 160 so-called ERIs (Emerging Risks Issues, risk scenarios) within ERRAs have been identified and described
- More than 900 early warnings (iNTeg-Risk "notions") acquired and partly processed in iNTeg-Risk system for acquisition and monitoring of early warnings: RiskEars
- More than 200 iNTeg-Risk specific KPIs (key performance indicators) identified, described and stored in iNTeg-Risk KPI Library with other approx. 2,000 relevant KPIs
- Integration works on ERRAs started or partly accomplished (e.g. Delphi workshops)
- iNTeg-Risk Paradigm defined and final report submitted
- iNTeg-Risk Framework defined and the final report drafted
- the development of iNTeg-Risk Safetypedia started
- iNTeg-Risk system for mapping of emerging and other risks (RiskAtlas) with over 200 layers of data related to hazards and vulnerabilities – e.g. earthquakes, hazardous materials, industrial plants (refineries, power plants, nuclear power plants), nature protection areas, carbon caption and sequestration plants, etc.; the emerging risks can be "recognized" by calculating the risk indicators for hazard-vulnerability pair from the points in the respective layers
- several innovative methods have been used for emerging risk identification and the tools for their application developed in the project: agent-based methods (e.g. for terahertz technology), intelligent fuzzy clustering and self-organizing networks (e.g. for emerging risk notions), ...
- (Pre-)Standardization activities: CEN workshop "General Framework and Guidelines for Early Recognition, Monitoring and Integrated Management of Emerging New Technology Related Risks (iNTeg-Risk)" (WS 67) will start on November 4, 2011; Liaisoning activities with ISO TC 262 on Risk Management.

Fukushima & iNTeg-Risk



The example (left) shows a critical vulnerability-hazard pair (nuclear power plant Fukushima and epicenter of an earthquake) in **RiskAtlas**; the risk indicator takes into account

- nominal power of the power plant
- magnitude of the earthquake
- age of the power plant
- distance between the hazard and the vulnerability

Other factors, such as tsunami (below) can be considered, too.