

Background and Motivation

The tremendous impact of natural hazards, such as earthquakes, tsunamis, flooding, etc., which triggered technological accidents, referred to as natural-technological (NaTech) events, was demonstrated, for instance by the recent Tohoku earthquake and the following Fukushima disaster in 2011 or by the UK's 2015 winter floods which topped £5bn, with thousands of families and businesses that faced financial problems because of inadequate or non-existent insurance. The NaTech problem is quite relevant as up to 10% of industrial accidents, involving the release of Chemical, Biological, Radiological, Nuclear and high yield Explosives (CBRNE) substances, were triggered by natural hazards. To implement and support the Seveso III Directive 2012/18/EU which regulates the control of major accident hazards involving dangerous substances, XP-RESILIENCE intends to establish a network of individual research projects working towards Advanced Modelling and Protection – via metamaterial-based isolators/layouts-of Complex Engineering Systems for Disaster Reduction and Resilient Communities. In this respect, this workshop has the aim to offer to students and scholars a clear overview of the problems and the available solutions and tools. With important experts on Resilience and Na-tech risk the workshop will be a unique occasion to familiarize with this hot topic and be in contact with the resilience and risk community.

Scientific Committee

Oreste Bursi, Jamie Padgett, Paolo Gardoni, Valerio Cozzani, Edoardo Patelli, Nicola Tondini, Fabrizio Paolacci, Antonio Casimiro Caputo, Christoph Butenweg, Keisuke Minagawa

Local Organizing Committee

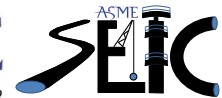
Fabrizio Paolacci, Antonio Casimiro Caputo, Keisuke Minagawa, Daniele Corritore, Silvia Alessandri, Hoang Nam Phan, Gianluca Quinci

Workshop Chair

Prof. Fabrizio Paolacci, Roma Tre University, Department of Engineering, Via Vito Volterra 62
00146, Rome, Italy

Session Topics

- A. **Open issues in the Na-Tech Risk and Resilience analysis of industrial installations.** This session focuses on the main issues concerning the risk and resilience calculation of critical infrastructures including Major-Hazard industrial installations under Na-Tech events (Earthquake, Flooding, etc..). Problems, including vulnerability assessment, Quantitative risk Analysis and Resilience definition and calculation are analyzed and discussed
- B. **Safety margins in presence of beyond-basis design conditions of industrial installations.** This session focuses on the methods and models for the evaluation of safety margin in presence of catastrophic events as per Na-Tech events. Fragility analysis, evaluation of collapse conditions and loss of containment and consequences, including escalation phenomena are analyzed and discussed.
- C. **Development of resilience concepts for Major-Hazard industrial installation under Na-Tech.** The session focuses on the development of resilience concepts and calculation methods for Major-Hazard installations under Na-Tech events.
- D. **Mitigation strategies and safety barriers for Major-Hazard industrial installations under Na-Tech events.** The session focuses on safety systems and strategies to reduce the risk and increase the resilience of Major-Hazard industrial installations, including safety barriers.
- E. **Na-tech risk analysis of Major-Hazard industrial installations: case studies.** This session focused on recent applications of risk and resilience assessment of relevant case studies in presence of Na-Tech events. The goal is to highlight problems and provide suggestions for the treatment of complex cases



Workshop on

Problems and perspectives in Na-tech Risk Assessment of Industrial installations and mitigation strategies for enhanced Resilience

Organized by the [Department of Engineering Roma Tre University](#) and the [Seismic Engineering Technical Committee \(SETC\) of ASME PVP division](#)

Chair: prof. Fabrizio Paolacci

Seminar Room of Civil Engineering

9-11 September 2019

Workshop objective

The main objective of this workshop is to familiarize Early Stage and Experienced Researchers with the State-of-the-art of risk and resilience of industrial installations. PhD students and Early Stage Researchers are strongly invited to participate in one or more sessions, presenting their work and discussing the results with colleagues and experts.

Who should attend

Graduated students, postdoctoral researchers and practitioners willing to acquire writing skill for a successful research activity

Workshop outline

The course will intend to: provide

- Basic and advanced concepts for risk and resilience calculation
- Vulnerability analysis of the most critical industrial facility facilities
- Risk analysis methods of major-hazard industrial installations
- Resilience concepts applied to industrial facilities Concepts application through case studies.

Workshop schedule

Monday 9

14.00-14.30 Registration and Opening

Plenary Lectures

14.30-15.00 **Oreste S. Bursi** – University of Trento Problems and Perspectives in Seismic risk and resilience of process plants

15.00-15.10 General Discussion

15.10-15.30 Coffee Break

Sessions

15.30-17.30 **Session A:** Open issues in the Na-Tech Risk and Resilience analysis of industrial installations (leader: **Daniele Corritore**, Roma Tre University)

Tuesday 10

Plenary Lectures

9.00-9.30 **Paolo Gardoni** – University of Urbana-Champaign – Illinois (USA) - Modeling of community resilience

9.30-10.00 **Jamie Padgett** – Rice University – Texas (USA), Above Ground tanks under concurrent surge, Wave and wind loads

10.00-10.10 General Discussion

10.10-10.30 Coffee Break

Sessions

10.30-12.30 **Session B:** Safety margins in presence of beyond-basis design conditions of industrial installations (leader: **Christoph Butenweg**, University of Aachen)

12.30-14.00 Lunch (by your own)

14.30-15.30 **Session C:** Development of resilience concepts for Major-Hazard industrial installation under Na-Tech (leader: **Antonio C. Caputo**, Roma Tre University)

15.30-16.00 Coffee Break

16.00-18.00 **Session D:** Mitigation strategies and safety barriers for Major-Hazard industrial installations under Na-Tech events (leader: **Keisuke Minagawa**, Saitama Institute of Technology, Japan)

Wednesday 11

Plenary Lectures

9.00-9.30 **Edoardo Patelli** – University of Liverpool (UK) - Reliability and resilient analysis of complex systems

9.30-10.00 **Valerio Cozzani** – University of Bologna, Italy - Safety barrier performance in Na-tech events

10.00-10.10 General Discussion

10.10-10.30 Coffee Break

Sessions

10.30-12.30 **Session E:** Na-tech risk analysis of Major-Hazard industrial installations: case studies (leader: **Silvia Alessandri**, Roma Tre University)

12.30-12.45 Conclusion and workshop statement



Registration

The participation is free of charge but the registration is required. To register please fill and send the following form to: silvia.alessandri@uniroma3.it or daniele.corritore@uniroma3.it by **September 1, 2019**.

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Workshop on

Problems and perspectives in Na-tech Risk Assessment of Industrial installations and mitigation strategies for enhanced Resilience

Rome, September 9 - 11, 2019

Application Form

(Please print or type)

Surname

Name

Affiliation

Address

E-mail

Phone

_____ Fax _____

Optional: Indicate the session/sessions selected where to present your work

A (), B (), C (), D (), E ()

Title of the presentation 1:

Title of the presentation 2:

Privacy policy: I understand that data received via this form will be used only to provide information about Roma Tre University and its activities, within the limits set by the Italian legislative decree no. 196/2003 and subsequent amendments.

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I have read the "Admission and Accommodation" terms and conditions and agree.

Date _____ Signature