ESReDA
European Safety, Reliability & Data Association

Newsletter

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ESReDA President
Mohamed Eid
RiskLyse, France

Dear ESReDA Members,

ESReDA went through a hard Year 2020. The hardest was to be obliged to move, cancel, or postpone, at the last minutes, events that had been decided long time ago. The negative impact was not financial. It was rather the loss of networking opportunities. ESReDA semi-annual seminar is one of the principal networking means ESReDA has. Hopefully, ESReDA has another major means that is ESReDA's Project Groups (PGs).

As most of you know, ESReDA PGs are thematic working groups. They are created after proposals from ESReDA members to establish the state-of-the-art on a given theme in relation with Systems Reliability, Safety and Data fields. Once a proposal is endorsed by ESReDA Board of Directors and approved by ESReDA General Assembly, the PG can officially start working on the proposed theme and use its allocated annual budget. The PG has 4 years, at maximum, to achieve its mission. It has two obligations: to deliver a technical report and to organise one ESReDA seminar at least. The technical reports are published in the form of books. In some cases, the books are sold. In some others, they are put in free access. Each of the experts participating in the PG receives a free copy of the Book. These experts are not necessarily ESReDA members. But the PG's leader should be an ESReDA active member.

I should congratulate all ESReDA PGs who took advantage of the pandemic context to reinforce the regular communications between their members and to boost their production during this hard year.

Their capability to switch, in a short time, their well-installed practices to a new operational pattern is to be greeted.

Today, two ESReDA PGs are finalising their technical books and will soon publish them.

Inspired by this success, ESReDA should move forward in generalising the use of the ICT tools to radiate wider and more frequently, within the community. ESReDA should make the best use of the ICT tools to enhance its visibility, attractiveness, and the quality of its intellectual production.

The integration of the ICT modern tools in ESReDA practices will be decided at all levels of its actions. The procedures to implement ICT tools in ESReDA practices will be discussed and designed with all ESReDA members. By the beginning of 2021, ESReDA members will be asked to participate by ideas and actions to conduct this deep transformation in ESReDA practices.

In the meantime, I would like to wish to all a joyful Christmas time and a wonderful end of the year 2020.

Stay safe and active…
Mohamed Eid

New Members

In 2020

ESReDA warmly welcomes the ***French National Research Institute for Agriculture, Food, and Environment*** (INRAE; France) and ***RiskLyse*** (France), who joined us as ESReDA Effective Members in 2020.

Mohamed Eid
RiskLyse, France

RiskLyse is a French Limited Responsibility Individual Enterprise identified under the French Law as an EIRL. RiskLyse offers its expertise in Stochastic Modelling & Simulation with a focus on System Safety & Risk Assessment Engineering, in industrial and academic environments. Within the informal platform Eid Associate Consultants, RiskLyse can manage and realise multidisciplinary projects, studies, and research activities

Jean-Marc Tacnet
INRE, France

INRAE is the French National Research Institute for Agriculture, Food, and Environment (INRAE), a major player in research and innovation which was created on January 1, 2020. INRAE carries out targeted research and resulted from the merger of INRA and IRSTEA. It is a community of 12,000 people with 268 research, experimental research, and support units located in 18 regional centres throughout France. Internationally, INRAE is among the top research organisations in the agricultural and food sciences as well as in the plant and animal sciences. It also ranks 11th globally in ecology and environmental science. It is the world's leading research organisation specialising in agriculture, food, and the environment. INRAE's main goal is to be a key player in the transitions necessary to address major global challenges. Faced with a growing world population, climate change, resources scarcity, and declining biodiversity, the institute is developing solutions that involve multiperformance agriculture, high-quality food, and the sustainable management of resources and ecosystems.

INRAE's Snow avalanches engineering and Torrent Control research unit (ETNA) is based in Grenoble (France) being part of Auvergne Rhône Alpes INRAE center and associated to Université Grenoble Alpes. It develops research related to reduction of mountains natural risks (especially snow avalanches, transport of snow by wind, torrential floods, debris flows, boulder falls, glacial risks). Its objectives include R&D activities in the analysis of triggering of processes, flows' dynamics, protection works design and management, interactions with exposed people, objects, activities and risk assessment and decision support in a context of rapid environmental changes. Physical and numerical modelling is supported by laboratory and field experiments. Other aims are also the study of protection techniques, mapping, and the development of information systems for natural risks management. The research unit therefore manages two national databases related to snow avalanches on behalf the French Ministry of Ecological Transition: the EPA (Permanent Survey on Avalanches) and the CLPA (Map of Location of Avalanche Phenomena). ETNA also conducts expertise in France or abroad, participates in the development of technical guides and carries out training and dissemination actions for stakeholders and practitioners.

A current research objective relates to management, efficacy and resilience assessment of protection structures used to reduce risk caused by natural phenomena to people, assets and infrastructures. In mountain torrent streams, check dams are, for instance, used to reduce sediment production.

Figure: structural (impacts, cracks) and functional (scouring) damage on a torrent check dam built to reduce erosion and reduce risk for people, critical infrastructures downstream (source J.-M. Tacnet)

Their deterioration over time, which cannot be avoided, influences their level of performance, and may lead to dramatic consequences downstream for exposed elements. Analysis and monitoring of those protections' efficacy and supporting decision-making for choosing the best maintenance strategies remain key challenges. New developments are expected to go beyond and integrate methods used both in safety and reliability analysis, decision-aiding and natural risks engineering and management: ESREDA is the right place to cooperate towards required multidisciplinary research and innovation.

Contact : *jean-marc.tacnet@inrae.fr*

Previous ESReDA SEMINARS

Luís Andrade Ferreira
University of Porto, Portugal

The 57th ESReDA seminar was held on 23rd-24th October 2019, hosted by the Technical University of Valencia and supported by the research and educational center C-Motores Termicos. There were eight paper presentations and three keynote speeches by Prof. Olga Fink (ETH Zurich), Prof. Sebastián Martorell (U. Politècnica de València) and Prof. Marco Riani (U. de Parma). Also, in a round table, it was discussed by Henk Wells and Mohammad Raza the problems dealing with the application of digital concepts to Risk Based Inspections.

In general, the presentations were of very high quality and dealt with the problems related with the application of Artificial Intelligence to Safety, Reliability and Data Analysis. The proceedings of the 57th ESReDA Seminar are already available at ESReDA website.

Forthcoming ESReDA SEMINARS

The 58th ESReDA Seminar

Kaisa Simola
EC JRC
Petten, The Netherlands

Zdenko Simic
EC JRC
Petten, The Netherlands

The 58th ESReDA Seminar on Using Knowledge to Manage Risks and Threats: Practices and Challenges

Updated dates: 15-16 June 2021, Alkmaar, The Netherlands

will be held on the 15th-16th June 2021, hosted by European Commission Joint Research Centre (EC JRC), Taqa Theater De Vest, Alkmaar, the Netherlands. In a case Covid19 situation prevents full physical meeting, hybrid and fully virtual options will be considered.

The 58th ESReDA seminar will be a forum that aims to discuss theories, concepts, and experiences of enhancing the use of knowledge for better risk management and governance. This seminar will bring together researchers, practitioners, specialists, and decision-makers to discuss strategies and practical experiences.

Papers for the seminar are invited from various stakeholders, from practitioners to researchers (industrialists, regulators, safety boards, universities, R&D organisations, engineering contractors and consultants, training specialists).

Submission of abstracts: before the **15th of January 2021** at Easychair.

The **call for papers** is **available** on the ESReDA website and seminar online platform at EasyChair.

The registration will open in mid-February 2021 till the 15th of May 2021. A registration form and information package for the venue will be made available on the ESReDA website and EasyChair. Contact email address for all questions about seminar is JRC-ESREDA58SEMINAR@ec.europa.eu.

Project Groups

Nicolas Dechy
IRSN, France

Previous Project Groups "Accident Investigations" and "Dynamic Learning" have focused on investigating and learning after the event. Lessons from major accidents and crises have shown that there were early warning signs (EWS) that could have, to some extent, provided useful information and to some extent been "relevant tools" for preventing major events.

Project Group "**Foresight in Safety**" (PG FiS) was active for five years until end of 2020 and is issuing its 250 pages deliverable "**Enhancing Safety: The Challenge of Foresight**". Twenty co-authors provided thirteen chapters addressing:

- Opportunities provided by future studies to safety domain;
- Safety paradigms evolutions such as with resilience and whistleblowing;
- Failures of foresight in risk analysis, with fantasy planning and blindness to EWS;
- Loss of memory to lessons learned and about EWS;
- The use of scenarios, retrospectively and prospectively,
- The visibility of EWS within event investigation,
- The use of ESReDA Cube to discover if lessons to be learned were missed,
- Some ways to employ organizational factors for better preventing next accidents,
- The monitoring of EWS in asset management,
- The added value of Big data for detecting hidden correlations, and potential EWS,
- The role of whistle-blowers to detect and alert about EWS,
- The role of technology in the introduction and detection of EWS,
- The role or regulators to prevent next accidents for other companies.

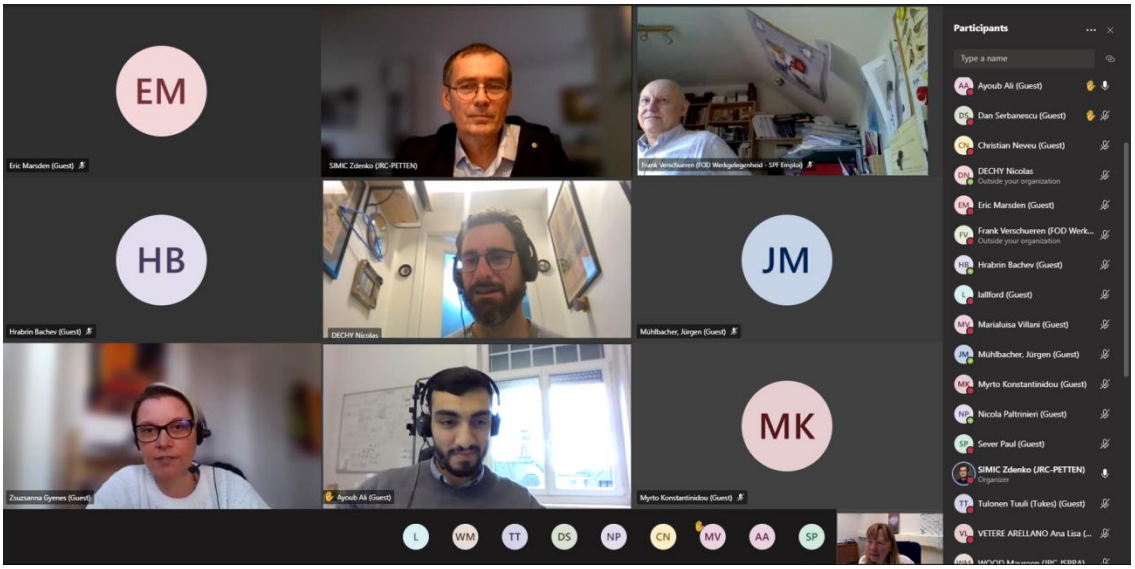
The report will be available soon on ESReDA and on European Commission Joint Research Centre (JRC) websites. A printed version will be edited by JRC and distributed to all ESReDA members. Some

of the active members of the PG FiS will join the new PG "Risks, Knowledge and Management".

In collaboration with the JRC, ESReDA organized the 53rd Seminar entitled Enhancing Safety: the Challenge of Foresight in Ispra, Italy. The final proceedings of the 53rd ESReDA Seminar are already available at ESReDA and JRC website for download, in compliance with ESReDA politics of free dissemination of scientific and technical knowledge.

Zdenko Simic
EC JRC
Petten, The Netherlands

The Project Group on ***Risk, Knowledge and Management*** was launched on 19th November 2020 in online kick off meeting. This RKM PG is led by Dr. Zdenko Simic (zdenko.simic@ec.europe.eu) from the European Commission Joint Research Centre (EC JRC, https://ec.europa.eu/jrc/en/about/jrc-in-brief) in the Netherlands and the RKM PG secretary is Eric Marsden (eric.marsden@foncsi.org) from FonCSI (https://foncsi.org/) in France. This PG is going to focus on the intersection of risk, knowledge, and management in different domains. The kick-off meeting attracted the attention of 20 participants, and several more have expressed their interest to later join the RKM. Initial agreement was to focus work on case studies (e.g., Covid19, Boeing 737MAX and Fukushima) and how knowledge management could improve prevention of accidents with better use of lessons learned from previous events. It was agreed in the meeting that the goal is to define specific topics in the next few months and agree about them on the second virtual meeting planned for January 2021. The RKM PG is going to support organisation of the 58th Seminar on Using Knowledge to Manage Risks and Threats: Practices and Challenges planned for 15-16 June 2021, Alkmaar, The Netherlands.



Siegfried Eisinger
DNV GL, Norway

Siegfried Eisinger, DNV GL, Norway has joined the board of ESReDA and has been asked to manage the Project Group, originally planned with the title "**Big Data, Reliability, Risk and Safety Analysis**". The 57th ESReDA Seminar in Valencia was arranged by Luiz Ferreira as a kick-off of this project group and has brought interesting insights and impulses.

Irrespective of that, the follow-up work in the project group has been slow – at least partially caused by COVID-19. Another challenge might be that the theme is rather wide and a core project group needs to gather around some more specific issues in the area – in competition with many initiatives within the field of digitalization.

The partners, which have so far shown interest are

- DNV GL (contact person: Siegfried Eisinger)
- ETH Zürich (contact person: Prof. Olga Fink)
- NorwAI (a Norwegian centre for innovation, Trustworthy AI contact person Elizabeth Traiger)

We are currently planning a series of webinars around

"Trustworthy Complex and Intelligent Systems"

A detailed schedule will be announced beginning of January 2021. It is confirmed that we start with 2007 Turing Award winner Joseph Sifakis. The webinars, which are so far anticipated cover themes like

- Can we trust AI systems and autonomous systems?
- TRUSST. An industrial example of providing trust in the deployment of a zero emissions autonomous passenger ferry - challenges, opportunities, approaches
- AI + Safety, can we trust AI to keep us safe? - Why we need to combine causal- and data-driven models
- Overview of existing regulations and guidelines
- Panel discussion with owner, manufacturer and component manufacturer on issues and

challenges to be solved

ESReDA members are encouraged to suggest additional contributions. The plan is to evaluate the interest the webinars create and use the feedback to identify a focused approach in the PG, probably implying an updated title.

Rasa Remenyte-Prescott
University of Nottingham, UK
The Netherlands

John Andrews
University of Nottingham, UK

PG on **Resilience Engineering and Modelling of Networked Infrastructure**

Many of the critical infrastructure systems on which modern society is so dependent are networks. These include transport networks (rail, metro, highway, air traffic and shipping routes), utilities (electricity, gas, water) and communications (mobile phone, land line phones, internet). The disruption of such systems can have a big impact on the communities that they serve. The nature of the threats to these systems is also changing and includes failures, especially of aging infrastructure, natural disasters, the effects of climate change and deliberate acts such as terrorism. Such critical systems need to be resilient.

This project group, now in its third year, and with a base of 35 members, is focussing on the transport and utilities networks to keep the project manageable over three years. For these sectors we are looking at the characteristics of each of the networks and the methods which exist to model their resilience and identify the weaknesses where the most effort should be expended to protect the performance of the network.

The following issues are being addressed by the Project Group:

- The concept of resilience is not yet well-defined in System-Engineering. Modern engineering systems are growing in size and complexity, they are also becoming more distributed, integrated and autonomous. A unified, consistent approach is required to enable their resilience to the full range of potential threats.
- The metrics predicted along with the methods to do so are inconsistent in the absence of a well-defined proven concept of resilience in system-engineering. A unified modelling framework will be considered.

A whole life, whole system approach will be considered by the project group.

There is a potential for follow on project groups to investigate networked systems in other sectors.

The Project Group main objectives are:

- To develop a forum by which the leading researchers from both academia and industry can meet, exchange ideas and where appropriate work together on projects relevant to the area of Resilience Engineering for Networked Systems.
- To produce a technical reference text which will document the current state-of-the-art along with the advances made over the duration of the project in the aspects of Resilience Engineering that have been the focus of the work. Papers are currently being collated and reviewed, for publication of the book in 2021.
- To disseminate the work conducted emphasizing its practical application at the 60th ESReDA seminar, to be held in Spring 2022, Université Grenoble Alpes, France.
- To organize special sessions at International Conferences, with the next session potentially at ESREL 2021, 19-23 September 2021, Angers, France.

Our PG meetings have now successfully moved online due to COVID-19 disruption. Our last meeting on the 15th July 2020, was attended by 19 of our contributors via Microsoft Teams, and in addition to sharing news and updates we welcomed presentations from the following group members:

- Prof Giovanni Sansavini - Reliability & Risk Engineering Laboratory, ETH Zurich, “Engineering Resilience of Critical Infrastructure Systems”.
- Dr Claudia Fecarotti - Operation, Planning, Accounting and Control Group (OPAC), Department of Industrial Engineering and Innovation Science, Eindhoven University of Technology, “Towards Smart and Sustainable Infrastructures (TaSaSi) – An overview”
- Dr Russell Lawley - Team Leader: Product development – GeoProperties, British Geological Survey, “Recent BGS activities concerning infrastructure resilience: maps, models and managing expectations”.

Joint Project group Leaders:

- Dr Rasa Remenyte-Prescott, University of Nottingham,
- Professor John Andrews, University of Nottingham.

Project group Secretary – Kathryn Sanderson, University of Nottingham (mail to contact).

Forthcoming Conferences & Seminars

Bruno Castanier
General Chair
Université d'Angers, France

Marko Čepin
General Co-Chair
University of Ljubljana, Slovenia

The 31st European Safety and Reliability Conference (ESREL 2021)
19 - 23 September 2021, Angers, France

For more than 30 years now, ESREL has been one of the key annual events for meetings and knowledge exchange in order to innovate for a better control of risks and optimization of the performance of socio-technological systems. It is a real place of conviviality for our community of safety and reliability specialists, safety and reliability in their broadest senses. In Angers, we want to continue in this tradition without, of course, forgetting the quality and scientific relevance and the innovative nature of your proposals. The richness of the event will therefore come from you.

I am not going to remind you of the interests of our activities in all industrial sectors but, if tradition is respected concerning the chairman's word, I will relate it to my feeling of the acceleration of the maturation and transfer processes of the research results to their applications which are drastically shortened. In other words, we are witnessing a massive and rapid industrialization of theoretical and fundamental knowledge, revolutionizing the traditional roles and relationships between industrial practitioners and academic researchers, the former no longer necessarily being the prescribers of needs and the latter their model developers.

ESREL 2021 could thus be the time and place for exchanges around the theme "Guaranteeing in an accelerating world ".

You are invited to share your last research results and technical works to the 31th annual European Safety and Reliability conference (ESREL 2021 – http://esrel2021.org). The ESREL 2021 will be held in the city of Angers (France) from 19th to 23rd September 2021. In Angers, in addition to the classical methodological and application areas, we also aim to promote big data-related methodologies and applications for improving reliability and safety.

In order to minimize the risks related to the evolution of health rules for international travel according to the current situation of the Covid19 pandemic and to maximize the guarantee of everyone's participation in a safe environment, the ESREL 2021 conference will be offered in an hybrid organization allowing participants to register physically or to connect remotely. Online participation will benefit reduced registration fees.

Important submission dates:

December, 1st 2020: Opening for invited special session proposals

December, 31st 2020: Submission deadline for invited special session proposals

January, 15th 2021: **Abstract Submission deadline** for regular papers and special session's papers

We are looking forward to welcoming you and sharing good scientific exchanges with nice moments of conviviality and gastronomy in our beautiful city of Angers, steeped in history.

André Lannoy
ESReDA Honorary Member,
IMdR, France

The λμ 22 Congress has become an e-Congress

The e-Congress e-λμ 22, organized by the IMdR (Institut pour la Maîtrise des Risques), is 100% virtual due to the pandemic, a new approach that illustrates the digital transformation, the theme of our previous λμ 21 Congress. It will run from October 2020 to January 2021, over one day and four half-days.

The opening session is scheduled for October 13 with our round table. Three sessions are then scheduled for the afternoons of November 10, November 24 and December 08. Finally, the closing session is scheduled for January 19 in the afternoon with a plenary session devoted to feedback and perspectives following the covid crisis. The tutorials were held on October 06, 2020.

The congress will have exactly the same format as the congresses of previous years, with its sessions, round tables, interactive sessions, exhibition and workshops.

The main theme of the e-Congress concerns "the risks of transitions", a very topical subject. Pierre-Etienne Labeau, professor at the Université Libre de Bruxelles, chaired the program committee. More than 150 papers will be presented.

For more information and registration, please visit www.imdr.eu.

John Andrews
Co-Chair
University of Nottingham, UK

Phuc Do
Co-Chair
University of Lorraine, France

11th IMA International Conference on Modelling in Industrial Maintenance and Reliability

28 June - 2 July 2021, online conference via Zoom

The 11th International Conference on Modelling in Industrial Maintenance and Reliability (MIMAR) will take place virtually via Zoom from 28 June – 2 July 2021. This event is the premier maintenance and reliability modelling conference in the UK and builds upon a very successful series of previous conferences. It is an excellent international forum for disseminating information on the state-of-the-art research, theories and practices in maintenance and reliability modelling and offers a platform for connecting researchers and practitioners from around the world.

The submission deadlines for abstracts and the optional full paper for inclusion in the Conference Proceedings are listed below.

Conference Proceedings: authors are invited to submit their paper for publication in the proceedings. All submissions will be peer reviewed and accepted papers will appear in the conference proceedings. The conference proceedings will be indexed by DOI system.

Special Issue: delegates are invited to submit papers to a Special Issue on "Advanced Maintenance Modelling for Industrial Systems" of Journal of Risk and Reliability: Proceedings of the Institute of Mechanical Engineers Part O, guest edited by the conference chairs. Papers will be subject to the standard peer review processes of the journal. A paper submitted to the Special Issue cannot be the same as a paper published in the conference proceedings.

Abstracts of 100-200 words via https://my.ima.org.uk **by 13 March 2021**.

Notification of abstract acceptance by 21 March 2021.

Optional paper submission to conferences@ima.org.uk for conference proceedings by 15 May 2021.

Final deadline for acceptance for conference proceedings by 15 June 2021.

Submission of extended papers for consideration for fully refereed special issue of Journal of Risk and Reliability by 1 November 2021.

For further information on the conference, including instructions for authors, please visit the conference webpage.

We hope you can attend.

Other Conferences and Seminars

CYSENI 2021 – the 17th Annual International Conference of Young Scientists on Energy Issues
24-28 May 2021, Kaunas, Lithuania. Call for papers at the CYSENI website.

CRITIS 2021 – the 16th International Conference on Critical Information Infrastructures Security
27-29 September 2021, Lucerne, Switzerland. Call for papers at the CRITIS 2021 website.

ESReDA Members, you are kindly invited to contribute to the ESReDA newsletter sharing news, announcement of events, your experiences, ideas, etc. You are supposed to elaborate proposals to create new Project Groups, host ESReDA Seminars or initiate collaborative activities.