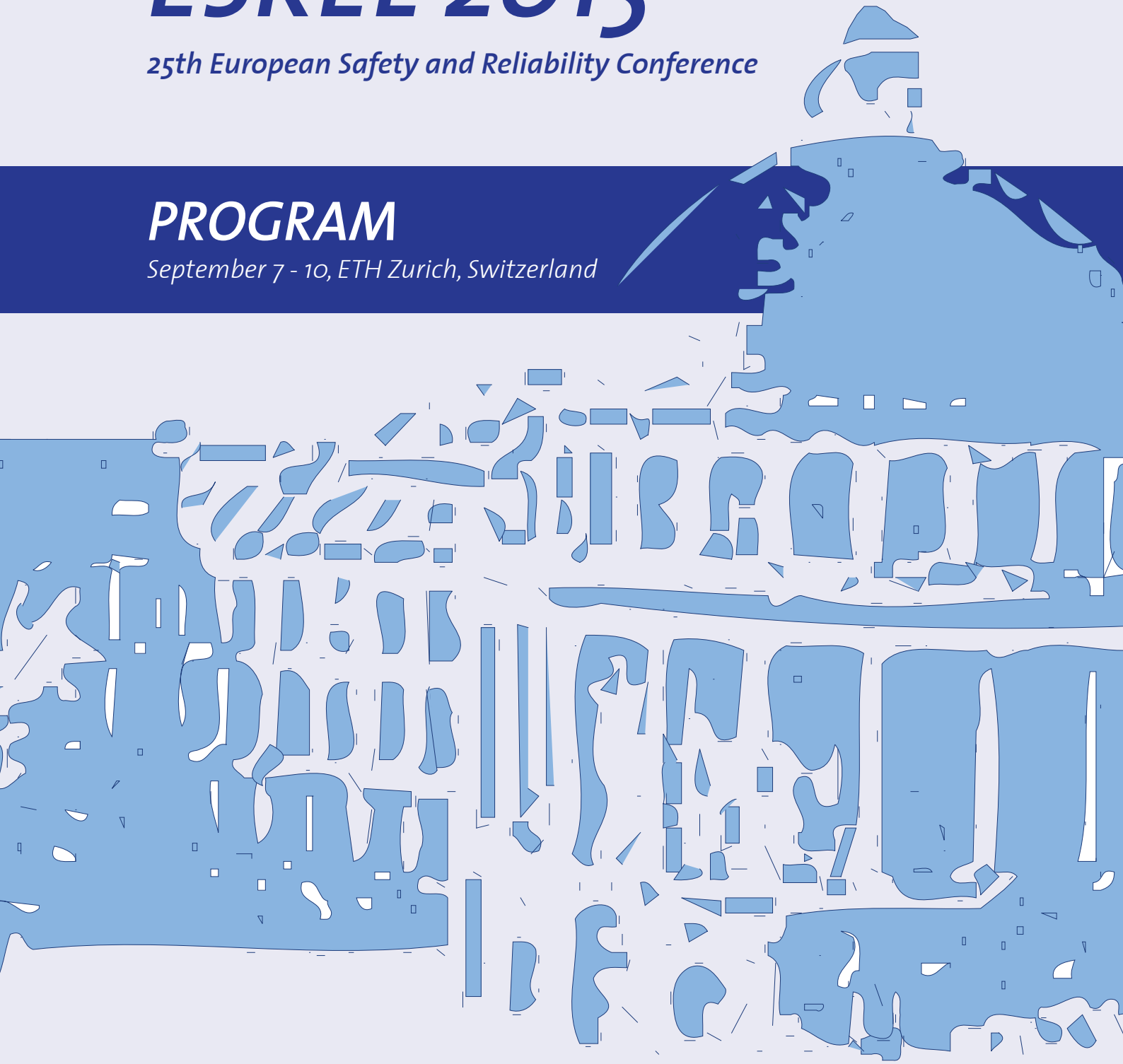
ESREL 2015

25th European Safety and Reliability Conference

PROGRAM

September 7 - 10, ETH Zurich, Switzerland



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Program design: *Emil Honegger,* ETH Zurich

Preface

The annual European Safety and Reliability Conference, ESREL, stems from a 1989 European initiative to merge several national conferences into a major yearly conference under the auspices of the European Safety and Reliability Association, ESRA. The 25th edition of the conference, ESREL 2015, provides a forum for presentation and discussion of scientific contributions covering the theories and methods in the field of risk, safety and reliability, and their application to a wide range of industrial, civil and social sectors and problem areas. ESREL 2015 is also an opportunity for researchers, practitioners, academics and engineers to meet, exchange ideas, and gain insights from each other.

Our goal for ESREL 2015 is to advance the understanding, modeling, and managing of complex engineered systems. ESREL 2015 offers a multidisciplinary platform to address the technological, societal and financial aspects of system safety and reliability. We aim to broaden the scope of risk, safety and reliability studies from the purely technical to the natural, financial and social aspects, focusing on the interdependencies of functions and the cascade of failures that characterize complex engineered systems.

ESREL 2015 is the largest ESREL to date. More than 850 abstracts were submitted, followed by more than 650 full papers. The Techncal Committee reviewed all submitted papers and accepted 569 of them for publication in the ESREL 2015 Proceedings. Of these, 563 papers will be presented at this conference. We greatly appreciate the efforts of the authors to write, revise and submit their papers, as well as the diligence and speed of the reviewers to evaluate the submitted papers and offer constructive criticism and suggestions for improvements.

ESREL 2015 takes place at ETH, the Swiss Federal Institute of Technology, in Zurich, Switzerland. Since its founding in 1855, ETH has been one of the leading international universities for engineering, technology and the natural sciences. The ETH Risk Center and the Paul Scherrer Institute are sharing the organization of this Conference.

Acknowledgements

The support of ESREL 2015 sponsors, Swiss Re, AXA Winterthur, the Swiss Federal Office of Civil Protection, and the City of Zurich, is gratefully acknowledged.

We thank Professor Emeritus Wolfgang Kröger for serving at the ESREL 2015 Honorary Chairman and suggesting complex engineered systems as the conference theme. We gratefully acknowledge the Chairs of the ESRA Technical Committees, the members of the ESREL 2015 Technical Program Committee, and the numerous ESREL 2015 Reviewers, listed on the following pages, for volunteering their time and doing an exceptionally good job. We also thank the ESREL 2015 Keynote Speakers for offering their unique perspectives on risk, safety and reliability at this conference. We appreciate the effort of the following ESRA TPC members for their contribution to the organization of thematic sessions: Olga Fink for the sessions on RAMS in railway systems, Andrija Volkanovski for the sessions on nuclear PSA, Ralf Mock for IT Security Risk Assessment session, Tomasz Nowakowski for supply chain and logistic systems session, and Stig Johnsen for sessions on human factors.

Finally, we are deeply obliged to the ESREL 2015 Organization Team without whom ESREL 2015 would not have taken place.

Božidar Stojadinović
Enrico Zio
Wolfgang Kröger
Luca Podofillini
Bruno Sudret

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We gratefully acknowledge the support of ESREL 2015 sponsors:

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a leading wholesale provider of reinsurance, insurance and other insurance-based forms of risk transfer.

AXA Winterthur

a Swiss company with tradition in personal, property and liability insurance, member of the AXA Group.

City of Zurich

the largest city in Switzerland, one of the most beautiful places to live in and visit.

Schweizerische Eidgenossenschaft
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Eidgenössisches Departement für Verteidigung, Bevölkerungsschutz und Sport VBS

Bundesamt für Bevölkerungsschutz BABS

The Federal Office for Civil Protection of the Swiss Federal Department of Defense, Civil Protection and Sport (BABS)

supports the cantons and municipalities as well as the partner organizations (e.g. police, fire and health care services) in their civil protection activities.

Organizers

ETH Zürich

the Swiss Federal Institute of Technology, is one of the leading international universities for technology and natural sciences. It is well known for its excellent education, groundbreaking fundamental research and for implementing its results directly into practice. Founded in 1855, ETH Zurich today has more than 18,500 students from over 110 countries, including 4,000 doctoral students. To researchers, it offers an inspiring working environment, to students, a comprehensive education. Twenty-one Nobel Laureates have studied, taught or conducted research at ETH Zurich, underlining the excellent reputation of the university.

ETH Risk Center

is an ETH Zurich interdisciplinary research center focused on understanding the growing complexity and interdependence of our social and engineered systems, and discovering and modeling related behavioral phenomena. The Risk Center promotes "system-of-systems" thinking and theory and builds an integrated view of risk landscapes. It also serves as an interface between academia, industry, and civil (or governmental) authorities. Its research output should help society and industry to better manage risk portfolios and to design novel solutions for collaborative risk reduction, and resilience-enhancing schemes.

PSI, Paul Scherrer Institute

is the largest research center for natural and engineering sciences within Switzerland. We perform world-class research in three main subject areas: Matter and Material; Energy and the Environment; and Human Health. By conducting fundamental and applied research, we work on long-term solutions for major challenges facing society, industry and science.

ESRA

the European Safety and Reliability Association, is a non-profit international association for the advance and application of safety and reliability technology in all areas of human endeavor. It is an "umbrella" organization with a membership consisting of national professional societies, industrial organizations and higher education institutions. The common interest is safety and reliability.

Exhibitors

SATODEV

is a SME specialized in Reliability Availability Maintainability and Safety software.

We develop scientific computation solutions to match your business specific needs. SATODEV is also official retailer of GRIF-Workshop, the RAMS workshop of TOTAL. We propose advanced expert assessment to the software use for complex studies.

Thanks to our combined competencies in dependability and computer science, we can provide both theoretical and practical training on GRIF-Workshop modules: Fault-Tree, Event-Tree, Reliability-Bloc-Diagram, SIL, Reliability-Network, Markov-Graph, Petri-Net, Stochastic-Bloc-Diagram, and Oil-And-Gas-Production-Availability-Study.

Whatever the customer, SATODEV provides personalized and direct contact, a great asset that allowed SATODEV to quickly find a position of choice facing major companies.

ISOGRAPH

develops integrated reliability, availability, maintainability and safety software.

Isograph was founded in 1986 and is now one of the world's leading companies in the development and provision of integrated Reliability, Availability, Maintainability and Safety software products. The company has offices near Manchester, UK and Alpine, Utah. Isograph employs experts in engineering, mathematics and reliability to design cutting-edge Reliability software.

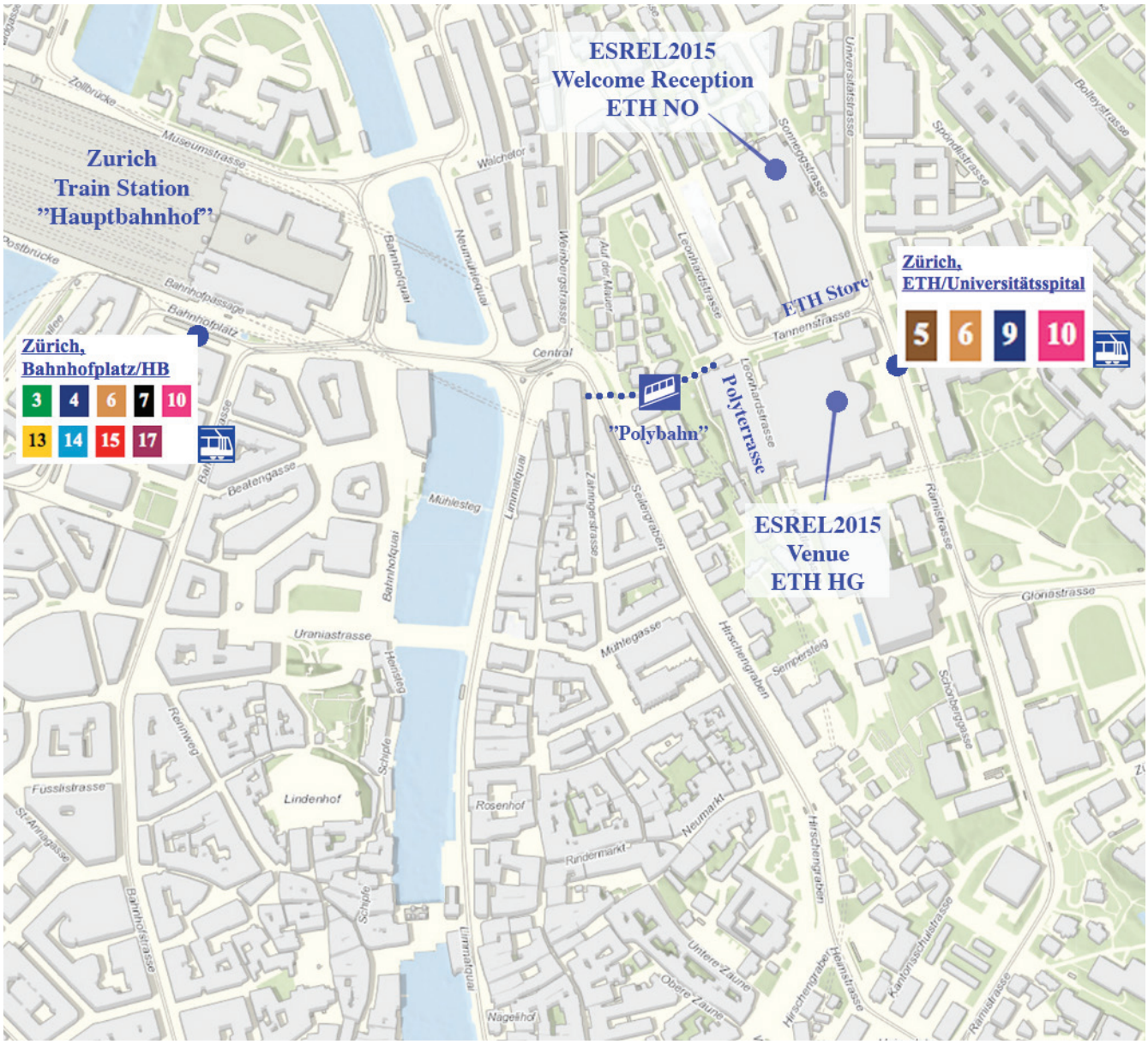
Our products are well proven in use at over 7000 sites worldwide where they are used on many high profile projects. Isograph software is used in all industries when Reliability, Availability and Safety are paramount. Isograph products are used at universities throughout the world to teach undergraduate and postgraduate courses in engineering.

Our customers span a wide range of industries such as: Aerospace; Automotive; Banking; Chemical; Defense; Electronics; Manufacturing; Mining; Oil and Gas; Power Generation; Process; Railways; and Utilities.

ETH Zurich Main Building

ETH Zurich Main Building
(also known as ETH Zurich Hauptgebäude – ETH HG) is located at Rämistrasse 101, 8092 Zürich. This historic building is the home of ETH since 1920.

ETH Zurich NO Building
is located at Sonneggstrasse 5, 8006 Zürich. Both can be reached easily by Zurich public transport (tram lines 6, 9 or 10 to stop "ETH/Universitätsspital" or by cable car "Polybahn").



Zurich public transport tram lines
Author: Stefan Baguette

Cable car "Polybahn"
Author: IBK-ETH

SUNDAY, September 6, 2015

18:00-20:00	**ESREL 2015 Welcome Reception NO Building, Focus Terra Exhibit**	

MONDAY, September 7, 2015

08:00	Registration	ETH Main Building Aula
9:00 - 9:40	Opening Session	ETH AUDI MAX
9:40 - 10:30	Keynote: Prof. Dr. Paul Embrechts (ETH)	ETH AUDI MAX
	10:30-10:50 Coffee Break, ETH Main Building Aula	
10:50 - 12:30	Parallel Sessions (1)	
	12:30-13:40 Lunch, ETH Restaurant "Mensa Polyterrasse"	
13:40 - 15:00	Parallel Sessions (2)	
	15:00-15:20 Coffee Break, ETH Main Building Aula	
15:20 - 17:00	Parallel Sessions (3)	
17:10 - 18:00	Keynote: Prof. Dr. Nassim Taleb (NYU)	ETH AUDI MAX

TUESDAY, September 8, 2015

08:00	Registration	ETH Main Building Aula
8:30 - 9:50	Parallel Sessions (1)	
	9:50-10:10 Coffee Break, ETH Main Building Aula	
10:10-11:00	Keynote: Dr. Didier Sornette (ETH)	ETH AUDI MAX
11:10-12:30	Parallel Sessions (2)	
	12:30-13:40 Lunch, ETH Restaurant "Mensa Polyterrasse"	
13:40-15:00	Parallel Sessions (3)	
	15:00-15:20 Coffee Break, ETH Main Building Aula	
15:20-17:00	Parallel Sessions (4)	
17:10-18:00	Keynote: ESRA Plenary Session	ETH AUDI MAX

WEDNESDAY, September 9, 2015

08:00	Registration	ETH Main Building Aula
8:30-9:50	Parallel Sessions (1)	
	9:50-10:10 Coffee Break, ETH Main Building Aula	
10:10-11:00	Keynote: Mr. Piere-Alain Graf (SwissGrid)	ETH AUDI MAX
11:10-12:30	Parallel Sessions (2)	
	12:30-13:40 Lunch, ETH Restaurant "Mensa Polyterrasse"	
13:40-15:20	Parallel Sessions (3)	
	15:20-15:40, Coffee Break, ETH Main Building Aula	
15:40-17:20	Parallel Sessions (4)	
	19:00-23:00 ESREL 2015 Gala Dinner, Zurich "Kongresshaus"	

THURSDAY, September 10, 2015

08:00	Registration	ETH Main Building Aula
8:30-9:50	Parallel Sessions (1)	
	9:50-10:10 Coffee Break, ETH Main Building Aula	
10:10-11:10	Keynote: ESRA Technical Committees	ETH AUDI MAX
11:20-12:40	Parallel Sessions (2)	
	12:40-13:50 Lunch, ETH Restaurant "Mensa Polyterrasse"	
13:50-15:30	Parallel Sessions (3)	
15:40-16:10	ESREL 2015 Closing Session	ETH AUDI MAX

Keynote Speakers

Monday, 07.09.2015 9:40-10:30
(ETH HG AUDI MAX),
Dr. Paul Embrechts, Professor of Mathematics at ETH Zurich

The Modelling of Rare Events: From Methodology to Practice and Back

In this talk I give a historically based overview of the modeling of rare or extreme events, highlighting important applications on the way. Modern society increasingly is faced with "events beyond the normal" ones. Be it in environmental science, structural engineering, demographics, insurance and finance, ... extreme events, their modeling, their impact as well as their risk management play a crucial role in citizens' day-to-day lifes. A crucial question no doubt is "What does science have to offer in these debates?". As a mathematician, I will focus on the time honored Extreme Value Theory (EVT), highlighting its main achievements, but also pointing out where EVT signals the end of the line. That point beyond which practical questions being asked have no meaningful scientific answer. This talk is in part based on material from the two textbooks: P.Embrechts, C.Klueppelberg and T.Mikosch (1997) Modelling Extremal Events for Insurance and Finance, Springer, and A.J.McNeil, R.Frey and P.Embrechts (2015) Quantitative Risk Management: Concepts, Techniques and Tools. Revised Edition, Princeton University Press (First Edition 2005).

Paul Embrechts
is Professor of Mathematics at the ETH Zurich specialising in actuarial mathematics and quantitative risk management. Previous academic positions include the Universities of Leuven, Limburg and London (Imperial College). Dr. Embrechts has held visiting professorships at the University of Strasbourg, ESSEC Paris, the Scuola Normale in Pisa (Cattedra Galileiana), the London School of Economics (Centennial Professor of Finance), the University of Vienna, Paris 1 (Panthéon-Sorbonne), the National University of Singapore, Kyoto University, was Visiting Man Chair 2014 at the Oxford-Man Institute of Oxford University, and has an Honorary Doctorate from the University of Waterloo, the Heriot-Watt University, Edinburgh, and the Université Catholique de Louvain. He is an Elected Fellow of the Institute of Mathematical Statistics and the American Statistical Association, Honorary Fellow of the Institute and the Faculty of Actuaries, UK, and Institut des Actuaires, France, Member Honoris Causa of the Belgian Institute of Actuaries, Corresponding Member of the Italian Institute of Actuaries, Swiss Association of Actuaries, and is on the editorial board of numerous scientific journals. He belongs to various national and international research and academic advisory committees.

Monday, 07.09.2015, 17:10-18:00
(ETH HG AUDI MAX),
Dr. Nassim Nicholas Taleb, Distinguished Professor of Risk Engineering at New York University's School of Engineering

Law of Large Numbers under Fat Tails and Model Error

The law of large numbers converges very slowly under fat tailed domains, which causes plenty of mistakes in scientific research and business decisions - mistakes made by "experts". We discuss corresponding biases in current naive measures of the GINI coefficient and quantile estimation of inequality. We also show flaws in current estimations of trends of violence. We show how they link to the underestimation of some classes of risk. We propose correcting techniques.

Nassim Nicholas Taleb
spent 22 years as a derivatives trader specializing in hedging nonlinear risks and managing payoffs under complicated probability distributions, before starting a second career in tail-risk management. He is currently Distinguished Professor of Risk Engineering at New York University.
Taleb is the author of the Incerto, a four-volume investigation of uncertainty, with a freely available technical backup, Silent Risk and corresponding technical papers.

Tuesday, 08.09.2015, 10:10-11:00
(ETH HG AUDI MAX),
Dr. Didier Sornette, Professor of Entrepreneurial Risk at ETH Zurich

Safety and Reliability in Dragon-Kings' Lair
I argue that most systems of interest to humans are punctuated by extreme events of outlier proportion (king) and of unique origin (dragon). The ubiquitous human nature to control their environments and their created artifacts may in fact participate to the creation of the dragon-kings. The bad news is that risks are much larger than currently quantified in most domains. The good news is that these risks do not come out of the blue, but can be anticipated and, in favorable cases, predicted. Indeed, dragon-kings tend to emerge at the climax of a slow maturation towards an instability both in natural and man-made structures. I will present a wealth of evidence for these claims in finance, economic geography, hydrodynamic turbulence, mechanical ruptures, avalanches in complex heterogeneous media, earthquakes, epileptic seizures, rock falls, epidemics, cyber-risks, nuclear disasters and so on. I will review the known existing mechanisms for the appearance of dragon-kings and present the feasibility to suppress them by tiny and occasional perturbations on the system, opening the field to the "control of dragon-kings".

Didier Sornette
is professor of Entrepreneurial Risks in the department of Management, Technology and Economics at the Swiss Federal Institute of Technology (ETH Zurich), a professor of finance at the Swiss Finance Institute, and is associate member of the department of Physics and of the department of Earth Sciences at ETH Zurich. He uses rigorous data-driven mathematical statistical analysis combined with nonlinear multi-variable dynamical models including positive and negative feedbacks to study the predictability and control of crises and extreme events in complex systems, with applications to financial bubbles and crashes, earthquake physics and geophysics, the dynamics of success on social networks and the complex system approach to medicine (immune system, epilepsy and so on) towards the diagnostic of systemic instabilities. In 2008, he launched the Financial Crisis Observatory to test the hypothesis that financial bubbles can be diagnosed in real-time and their termination can be predicted probabilistically. The Financial Crisis Observatory now delivers daily an extensive survey of +25000 assets worldwide and a summary cockpit of the main positive and negative bubbles developing in all asset classes. Since 2012, his group has developed InnovWiki, an original collaborating platform where users can openly collaborate and contribute to various ideas/projects, combined with a prediction market to facilitate quality assessment of various ideas/projects based on a wisdom of the crowd approach, and empowered by a tools repository and data visualization software.

Tuesday, 08.09.2015, 17:10-18:00
(ETH HG AUDI MAX),
Moderators: Dr. Terje Aven and Dr. Enrico Zio
Current and former Chairmen of ESRA

Uncertainties in Risk Assessment: How do we manage them? Do we manage them well? What is…the Risk?

Dr. Terje Aven
is Professor of Risk Analysis and Risk Management at the University of Stavanger. His research covers foundational issues in risk analysis and management; risk acceptance criteria and risk reduction processes; risk analysis methods; risk and societal safety; and more. He is the Chairman of the European Safety and Reliability Association (ESRA).

Dr. Enrico Zio
is Director of the Chair in Complex Systems and the Energetic Challenge of the European Foundation for New Energy of Electricité de France (EDF) at CentraleSupélec and Politecnico di Milano, full professor, President and Rector's delegate of the Alumni Association and past-Director of the Graduate School at Politecnico di Milano, adjunct professor at University of Stavanger. He is the former Chairman of the European Safety and Reliability Association (ESRA).

Wednesday, 09.09, 10:10-11:00
(ETH HG AUDI MAX),
Mr. Pierre-Alain Graf, CEO of SwissGrid

Systemic Risks in the Swiss Transmission Grid
The power system has its own dynamic. A simple pylon seems static, but many parallel actions are necessary to keep a high voltage transmission grid functioning. The Swiss transmission system is considered as a critical infrastructure and hence needs a distinct protection towards all kinds of risks. In the light of a stronger integration of transmission grid systems, risks are changing and risk management methods need to be adapted to the new reality. In order to be well prepared and fulfill regulatory and technical requirements, risk management needs to be performed at different levels: infrastructure, market systems, black swan events and human factors.

Pierre-Alain Graf
has a degree in Law from the University of Basel and a second degree in Business Administration from the University of St. Gallen. He completed a financial training course at the International Banking School in New York and the Advanced Management Program at Harvard University in Boston. Between 1992 and 1997 he held various management positions in IT at Crédit Suisse. He then set up several national subsidiaries for Colt Telecom and worked abroad for a number of years. In 2006 he moved to Cisco Systems Switzerland, where he acted as General Manager. At the end of 2008 he took up his current position as CEO of Swissgrid AG and since February 2009 he has been responsible for taking the national grid company into the next phase of electricity market liberalization.

Dr. Pieter van Gelder, Professor of Safety Science at Delft University of Technology

Innovations in Monitoring of and Dealing with Natural Hazards

We focus on possibilities to monitor natural hazards with all kinds of sensing techniques (ranging from remote sensing with satellites to sensing via citizen participation with smart phones) and in which we look into innovative methods to deal with these hazards (not only structural methods, but also measures on the right hand side of the bowtie, targeted mobile text messaging, safety apps, etc) with the ultimate goal to increase the safety in our society against natural hazards.

Pieter van Gelder

is full-time professor of safety science at the faculty of technology, policy and management of Delft University of Technology and director of the TU Delft Safety and Security Institute. He has been involved in research and education on safety and reliability since the early 1990's. The principal object of Van Gelder's research is the development of reliability methods for the optimal design of different types of systems, structures and processes in socio-technical environments. Identified key processes, involving technical, human and organizational factors, are modeled in a statistical technical-based framework, first analytically and then numerically or by simulation. Stochastic optimization models are implemented into decision support systems. Keywords of Van Gelder's research include: risk analysis, uncertainty analysis, extreme events, engineering probability, decision-making and Bayesian inference.

Dr. Christophe Berenguer, Professor of Systems Reliability, Monitoring and Control at Grenoble Institute of Technology & GIPSA-lab, Grenoble
Dr. Antoine Grall, Professor of Reliability and Maintenance Engineering at Troyes University of Technology

From RUL Prediction and Prognosis to Maintenance Decision: Looking for the Missing Link

In this presentation, we explore the complete predictive maintenance processing chain for a system, from deterioration monitoring and health status assessment, to remaining useful life estimation (RUL), right through to maintenance decision-making. Whereas these different issues are often considered separately, we believe that we can get better insight into the predictive maintenance problem when considering it as a whole. We develop different examples in the aim of sharing our conviction that the performance of a RUL prediction and prognosis procedure can be only properly assessed in light of the downstream maintenance decicision procedure and of the overall maintenance performance.

Christophe Berenguer

is a Professor of Reliability, Monitoring and Control Systems at Grenoble Institute of Technology, France and researcher at Gipsa-lab since 2011. From 1995 to 2011, he was a Professor at Troyes University of Technology. He graduated from Compiègne University of Technology (Diplôme d'ingénieur, 1990) and University of Nice Sophia-Antipolis (Doctorat, 1994). His research interests include stochastic modelling of system and structure deterioration and lifetime, performance assessment models of condition-based and predictive maintenance policies, reliability models for probabilistic safety assessment, and reliability of safety instrumented systems.

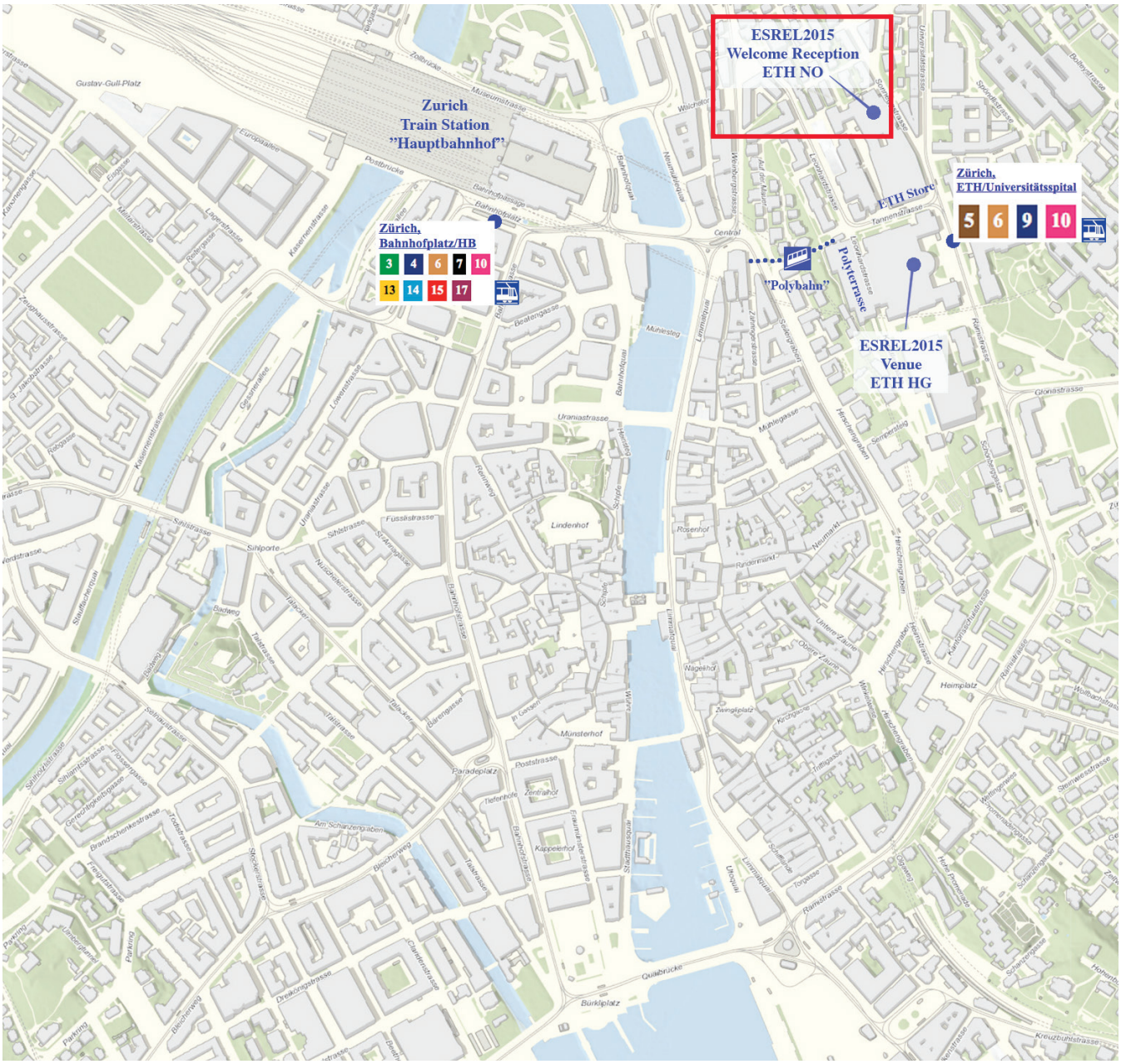
Dr. Antoine Grall

Antoine Grall is Full Professor at Troyes University of Technology, France, where he is currently head of the Operations research, Applied Statistics and numerical Simulation department. He holds a master degree in Engineering in computer science, a M.S. in automatic control and a Ph.D. in Applied Mathematics from the Compiègne University of Technology, France. He is a member of the Charles Delaunay Institute (CNRS UMR 6281) and responsible for the "Reliability and Maintenance" research group. His current research interests are mainly in the field of stochastic modeling for maintenance and reliability. He is the chairman of the ESRA standing committee for conferences.

Social Events

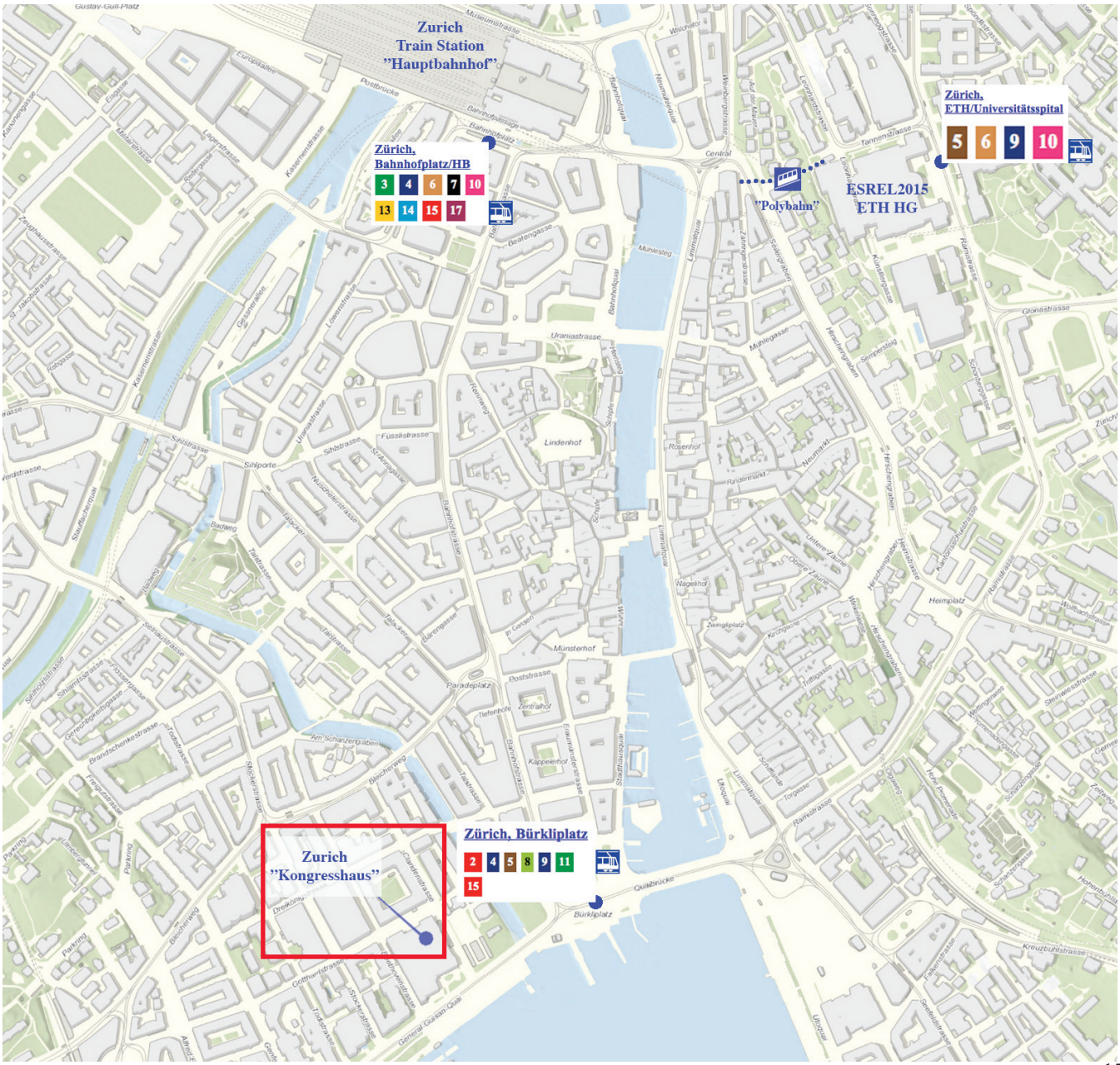
Sunday, 06.09.2015, 18:00-20:00
(ETH NO Building, focusTerra Exhibit)
Welcome Reception and Early Registration

The ESREL 2015 Welcome Reception will be held at the ETH NO Building inside the focusTerra, the Earth Science Research and Information Centre of ETH Zurich, which is an inspiring new museum that explains the geologic processes in and on our planet. It displays exciting aspects of the Earth and shows how earthquakes are triggered, what makes volcanoes erupt, and what fossils tell us about the origin of life. The burning issues of climate change, acute and long-term geologic hazards, the use of energy and other resources as well as the role of geosciences in tunnel construction and the disposal of hazardous waste are presented. A part of ETH Scientifica 2015, an exhibition about Energy and Light, will remain open during the ESREL 2015 Welcome Reception. Almost 30 education stations and experiments offer insights into the energy use of everyday devices and the energy potential of common raw materials.



Wednesday, 09.09.2015, 19:00-23:00
(Zurich Kongresshaus)
Gala Dinner (bring your voucher!)

ESREL 2015 Gala Dinner will be held at the Zurich Kongresshaus, a concert hall, convention and exhibition host at the core of Zurich's business, social and cultural events scene. The building was built to host the historic 1939 National Exhibition in Switzerland. The Kongresshaus can be reached by tram #9 going in the direction Heuried from the ETH Main Building to the Bürkliplatz stop, then walking westward two blocks along the lakeshore.



Conference Events

Tuesday, 08.09.2015, 17:10-18:00 (ETH HG AUDI MAX)
ESRA Plenary Session

Tuesday, 08.09.2015, 18:00-20:00 (ETH HG D5.2)
ESRA General Assembly Meeting

Special sessions

Monday, 07.09.2015, 10:50-12:30 (ETH HG E5)
ETH Risk Center Session, organized by the ETH Risk Center.

Monday, 07.09.2015, 10:50-12:30 and 13:40-15:00 (ETH HG E3)
Surrogate models in structural reliability, organized by Bruno Sudret, Nicolas Gayton, Jean-Marc Bourinet.

Monday, 07.09.2015, 15:20-17:00 (ETH HG F7)
Complexity in socio-technical-economic systems, organized by the ESREL 2015 scientific committee.

Tuesday, 08.09.2015, 11:10-12:30 (ETH HG D7.1)
Visualization in Risk Analysis, organized by Lesley Walls for the ESRA Technical Committee on Risk Management.

Tuesday, 08.09.2015, 15:20-17:00 (ETH HG E5)
Extreme weather events on power systems, organized by Royce Francis, Behailu Bekera, Ullrika Sahlin.

Tuesday, 08.09.2015, 15:20-17:00 (ETH HG D7.2)
Safety of autonomous systems, organized by Ingrid Bouwer Utne.

Wednesday, 09.09.2015, 13:40-15:20 and 15:40-17:20 (ETH HG E5)
Modeling interdependencies and cascades, organized by Giovanni Sansavini, Jonas Johansson, Henrik Hassel.

Wednesday, 09.09.2015, 15:40-17:20 (ETH HG E3)
Decision making under deep uncertainty, organized by Ullrika Sahlin.

Guidelines for Presenters and Session Chairs

Presentation

Each presentation has been allocated 15 minutes, with an additional 5 minutes for discussion. By observing these time limits, the presenters will show respect to the colleagues presenting in the same session and to the audience.

Presenters should upload their presentation onto the presentation computers before their session using a USB memory device. The presentation computers have an ESREL 2015 directory structure that corresponds to the session location, day and time. These computers are running the Windows 7 operating system, and are preloaded with Office 2010 and Adobe Acrobat Reader software to display PowerPoint and PDF files. No other file formats are supported.

Presenters are highly discouraged from using their own computers and should do so only in exceptional cases. Changing computers takes time away from other presenters and valuable discussions. In these special cases, presenters should verify that their presentation works by connecting their device to the projector in the room where they will present and trying their presentation out before their session. Conference staff will be there during the breaks to help.

Presenters should meet the Session Chair during the break before the session. They are encouraged to provide short written biographical statements to the Session Chair in advance.

Discussion and Time keeping

Session Chairs have the responsibility to introduce the speakers, to lead the discussions, and to ensure that the session schedule is observed. While every effort should be made to keep to the 20-minute total time allocation for each presenter, small (2-3 minute) deviations can be tolerated at the discretion of the Session Chair. In case a session presenter does not show up, the Session Chair should compensate, as much as possible, by allowing for appropriately extended discussion of the presented papers while maintaining the presentation sequence.

General Information

Registration Desk and Secretariat

The ESREL 2015 secretariat is available at the conference registration desk 8:00-17:00 every day of the conference to register you and to help you during this event. The registration desk is located in the ETH Main Building Aula, across from the main entrance at level E. Early registration will be held during the ESREL 2015 Welcome Reception on 06.09.2015.

Conference Badges and Vouchers

Conference participants are kindly requested to wear their ESREL 2015 nametags while attending any and all conference events. Please bring your lunch and gala dinner vouchers to these events.

ESREL 2015 Staff will wear their nametags on orange lanyards.

Conference Meals

ESREL 2015 coffee breaks will take place in the ETH Main Building Aula on level E.

ESREL 2015 lunches will be served in a self-service ETH Restaurant "Mensa Polyterrasse". To reach the restaurant, follow the signs across the ETH Main Building terrace down to the restaurant. The lunch selection covered by the ESREL 2015 registration is printed on each lunch voucher. Additional food or drinks can be purchased.

The ESREL 2015 Gala Dinner will start at 19:00 on Wednesday 09.09.2015 at the Zurich Kongresshaus. This venue can be reached by tram #9 going in the direction Heuried from the ETH Main Building to the Bürkliplatz stop, then walking westward two blocks along the lakeshore.

Proceedings Book

The papers presented at ESREL 2015 are included in the Proceedings of the Conference. The abstract book and the ESREL 2015 CD can be obtained using the proceedings voucher obtained during registration. The proceedings can be mailed at the SwissPost office located at ETH HG D33.3, open Mon-Fri 8:00-16:00 at the participants' own expense.

Internet Access

Wireless Internet access is available using ETH's "public" wireless network. Once connected, open your browser and use the following credentials to log in:

Login name: ESREL2015
Password: esrel2015@ETHZurich

Transportation

Zurich public transport (www.zvv.ch) is the best way to reach the ESREL 2015 venues and get around Zurich. Purchase a single-ride or a daily ticket using the ticket machines located at each stop. Look for the buttons at the bottom right to change the language.

Changes to the Technical and Social Program

ESREL 2015 organizers reserve the right to adjust or change the Technical and/or the Social Programs as, if and when necessary.

Language

The official language of ESREL 2015 is English.

CHANGES

some new session chair = red

session red:
relocated to other session

session green:
moved in from other session

session ~~strikethrough~~:
not presented

MONDAY September 7, 2015

Registration starts at
08:00

ETH Main Building Aula

Opening Session
09:00 - 09:40

AUDI MAX F30 (broadcast in E5)

Greeting from:
Conference Chairman (Prof. Stojadinović)
ESRA Chairman (Prof. Aven)
ETH (Rector Springman)
BABS (Director Bühlmann)
ETH Risk Center (Prof. Emeritus Kröger, Prof. Gersbach)

Afterwards 09:40 - 10:30

Keynote: Prof. Dr. Paul Embrechts (ETH Zurich)
AUDI MAX (broadcast in E5)

MONDAY September 7, 2015

Parallel Sessions

10:50 - 12:30

E 5

ETH RISK CENTER: RESILIENT INFRASTRUCTURE SYSTEMS

Chairman: Božidar Stojadinović

Introduction to the ETH Risk Center
Bastian Bergman

Resilience of Interdependent Energy Infrastructure
Giovanni Sansavini

Resilience of the Built Infrastructure
Božidar Stojadinović

Future Resilient Infrastructure Systems
Hans Rudolf Heinimann

E 3

SURROGATE MODELS: STRUCTURAL RELIABILITY I

Chairman: Bruno Sudret

Imprecise structural reliability analysis using PC-Kriging
Roland Schöbi, Bruno Sudret

Using Kriging for a fast verification of a spherical tank external radius
Nicolas Gayton, Gilles Defaux

A study on a stopping criterion for active refinement algorithms in Kriging surrogate models
Bruno Gaspar, Ângelo Palos Teixeira, Carlos Guedes Soares

Application of metamodel-based techniques for the efficient seismic analysis of structural systems
Elisa Ferrario, Nicola Pedroni, Enrico Zio, Fernando Lopez-Caballero

Estimating the small failure probability of a nuclear passive safety system by means of an efficient Adaptive Metamodel-Based Subset Importance Sampling method
Nicola Pedroni, Enrico Zio

D 1.1

SYSTEM RELIABILITY I

Chairman: Joanna Soszyńska-Budny

Calculating the failure frequency of Boolean systems subject to common random shocks
Günter Becker, Alexios Camarinopoulos, Leonidas Camarinopoulos

Stochastic comparison in reliability analysis
Maria Kamińska-Zabierowska

Reliability of phase mission linear consecutively-connected systems with constrained number of gaps
Huan Yu, Jun Yang, Yu Zhao

Probabilistic assessment of events sequences by a modular approach
Dorina Ionescu, Nicolae Brinzei, Jean-François Pétin

An approach of reliability assessment of systems based on graphs models
Nicolae Brinzei, Jean-Francois Aubry

D 1.2

MODEL-BASED SYSTEM ENGINEERING

Chairman: Antoine Rauzy

Integrated model for dynamics and reliability of intelligent mechatronic systems
Thorben Kaul, Tobias Meyer, Walter Sextro

A novel model-based approach for failure modes and effects analysis
Dezhen Yang, Yi Ren, Zili Wang

Model-Based Safety Assessment using FRAM for complex systems
Qibo Yang, Jin Tian

Model Based Safety Architecture Framework for Complex Systems
Katja Schuitemaker, Mohammad Rajabalinejad, Jasper Gerard Braakhuis

Model-based systems engineering and failure analysis: experience feedback
Rudy Kajdan, Vincent Idasiak

D 3.2

NATURAL HAZARDS: QUANTIFICATION

Chairman: Pieter van Gelder

A Seismic Risk model for Italian urban areas
Alessandro Rasulo, Carlo Testa, Barbara Borzi

Sampling Joint Time Series of Significant Wave Heights and Periods in the North Sea
Wiebke S. Jäger, Oswaldo Morales Nápoles

Historical flood events in the Tagus estuary. Contribution to risk assessment and management tools
Ana Rodrigues Rilo, Paula Freire, Pedro Pinto dos Santos, Alexandre Oliveira Tavares, Luís Sá

Flight Risk Assessment in Icing Conditions Based on Multivariate Extreme ValueTheory
Xiaolong Wang, Haojun Xu, Yun Xue, Zhe Li, Binbin Pei

Comparative Risk Assessment for Fossil Energy Chains: Severe Accidents triggered by Natural Hazards
Matteo Spada, Peter Burgherr, Evgenia Tsianou

MONDAY, September 7, 2015, Parallel Sessions

10:50 - 12:30

D 5.2

ACCIDENT ANALYSIS: TRANSPORTATION

Chairman: Coen van Gulijk

Balancing the Risk Between Railways and Roads
Manuel Kaegi, P. Gerber

Modeling of traffic safety indicators on Polish national road network
Marcin Budzynski, Kazimierz Jamroz, Wojciech Kustra, Joanna Zukowska

Accident Analysis of a Bus Rapid Transit unit in Mexico City
Vladimir Avalos-Bravo, Jaime R. Santos-Reyes

Traffic accidents: Random or Pattern Occurence?
Richard Andrášik, Michal Bíl

Learning from text-based close call data
Peter Hughes, Miguel Figueres-Esteban, Coen van Gulijk

D 7.1

RISK GOVERNANCE AND POLICY MAKING

Chairman: Lesley Walls

10 years from risk assessment to regulatory action – is complacency creating a reactive and brittle regulatory regime in Norway?
Stig Ole Johnsen, Anita Øren

Risk governance deficits revealed by the Oslo terror attacks
Marie Nilsen, Petter Grytten Almklov, Eirik Albrechtsen, Stian Antonsen

Table-top urban risk and resilience management for football events
Uli Siebold, S. Hasenstein, J. Finger, Ivo Häring

Challenges in the Context of the Development and Application of risk-informed Regulations and Norms
Peter Kafka

Security challenges for Europe
Dana Prochazkova, Jan Prochazka

D 7.2

HUMAN FACTORS: EXPERIMENTAL

Chairman: Yuanhua Liu

Human factors and quality control procedures: an example from the offshore oil & gas industry
Caroline Pinheiro Maurieli Morais, Raphael Neves Moura, Michael Beer, John Lewis

Protocol to evaluate the influence of stress on the task involving human types, behavior and health: An exercise proposal
G. Guimarães Gonçalves, K. R. Valeriano Nunes, R. Calabria Guimarães da Silva, S. Ávila Filho, R. da Silva Magalhães

Workload parameters and controlled area selection for railway traffic controllers
István Lövétei, Bence Számel, Géza Szabó

Influence of local archetypes on the operability and usability of instruments in control rooms
Salvador Avila Filho, Maria de Lourdes de Araújo Menezes

Evaluation of Human Error of Response to Auditory and Visual Signals in the Virtual Reality
Lubos Kotek, Zdenek Tuma, Petr Blecha, Zuzana Nemcova, Petr Habada

F 5

MAINTENANCE MANAGEMENT

Chairman: Antoine Grall

Long-term budget requirements for the replacement of bridges and hydraulic structures
Robin P. Nicolai, H. E. Klatter

Enabling maintenance performance prediction by improving performance indicators
Chris Rijsdijk, Tiedo Tinga

Assessing the potential for utilising the economies of scale by grouping maintenance activities on water infrastructure
Marius Møller Rokstad, Rita Maria Ugarelli

General Framework about Graphical Analysis for Operation Management
Pablo Andres Viveros, F. Kristjanpoller, A. Crespo, L. Barbera, R. Stegmaier, E. Johns, T. Grubessich

A Methodological Proposal to meet analysis requirements with purified information through a logical work sequence and a decision tree in the field of maintenance management
T. Grubessich, R. Stegmaier, E. Johns, P. Viveros, F. Kristjanpoller

F 7

NUCLEAR SAFETY: PERSPECTIVES

Chairman: Olivier Nusbaumer

Not Losing to the Rain: What I learned about when I learned about Onagawa
Woody Epstein

What can we learn about "engineering thinking in extreme situations" from the testimony by the Fukushima Daiichi plant manager?
Aissame Afrouss, Aurélien Portelli, Franck Guarnieri

Post Fukushima lesson learned for Probabilistic Safety Assessment
Manorma Kumar, Andreas Wielenberg, Emmanuel Raimond

Recent and Future Activities of the OECD Nuclear Energy Agency Working Group on Risk Assessment (WGRISK)
Marina L. Roewekamp, Vinh N. Dang, Raducu Gheorghe, Jeanne-Marie Lanore, Kevin Coyne

Exhaustive statistical assessment of nuclear risks: new database and extreme heavy tailed distributions
Spencer Wheatley

MONDAY September 7, 2015

Parallel Sessions

13:40 - 15:00

E 5

RESILIENCE ASSESSMENT: ACROSS SECTORS

Chairman: Terje Aven

Probabilistic Resilience assessment of civil systems: analysis and validity of the PEER framework
Marco Broccardo, Pnagiotis Galanis, Simona Esposito, Božidar Stojadinović

Computational Techniques for the Approximation of Total System Resilience
Dante Gama Dessavre, Jose Emmanuel Ramirez-Marquez

Concept of railway transportation system resilience – an introduction
Franciszek Jozef Restel

E 3

SURROGATE MODELS: STRUCTURAL RELIABILITY II

Chairman: Jean-Marc Bourinet

Addressing high dimensionality in reliability analysis using low-rank tensor approximations
Katerina Konakli, Bruno Sudret

Probabilistic approach of carbonation-induced corrosion initiation via a surogate model
Viet Duc Ngo, Thomas de Larrard, Frédéric Duprat

Comparison of surrogate models for time-variant reliability analysis
Lara Hawchar, Charbel-Pierre El Soueidy, Franck Schoefs

Surrogate modeling of nonstationary systems with uncertain properties
Luis David Avendaño-Valencia, Eleni N. Chatzi, Minas D. Spiridonakos

D 1.1

RISK AND RELIABILITY: IMPORTANCE MEASURES

Chairman: Emanuele Borgonovo

RAM-C: A novel methodology for evaluating the impact and the criticality of assets over systems with complex logical configurations
Fredy Kristjanpoller, Pablo Viveros, Adolfo Crespo, Tomas Grubessich, Raul Stegmaier

Importance Measures in Time-dependent Reliability Analysis and System Design
Hananeh Aliee, Emanuele Borgonovo, Michael Glaß, Jürgen Teich

New Algorithm for Calculation of Fussell-Vesely Importance with Application of Direct Partial Logic Derivatives
M. Kvassay, Elena Zaitseva, J. Kostolny, V. Levashenko

An evolutionary decision support system for the top event early detection
Sebastiano Spampinato, Bruno Martino, Ferdinando Chiacchio, Lucio Compagno, Diego D'Urso

D 1.2

IT AND TELECOMMUNICATION SYSTEMS I

Chairman: Ralf Mock

IT Risk Audit Tool to Enhance IT Risk Assessments
Ralf Mock, Benjamin Truninger, Patrick Brunner, Giedrius Pociuipa, H. Hruz

Safety electronic systems reliability monitoring program in nuclear power plant
Sergio Dias Costa

Functional Diversification for Software Fault Tolerance in Data Fusion: a real Application on Kalman Filters for Mobile Robot Yaw Estimation
Kaci Bader, Benjamin Lussier, Walter Schön

Safety demonstration challenges and recommendations in the nuclear field
Peter Karpati, A. A. Hauge, V. Katta, C. Raspotnig

D 3.2

NATURAL HAZARDS: VULNERABILITY ANALYSIS

Chairman: Peter Burgherr

Territorial vulnerability to flooding in an estuarine area. Challenges valuing the structural and societal local ensemble
Pedro Pinto dos Santos, Alexandre Oliveira Tavares, Paula Freire, André Bustorff Fortunato, Ana Rodrigues Rilo

An overview of the methodologies to investigate on Na-Tech events triggered by volcanic ash fallouts
Giuseppa Ancione, Maria Francesca Milazzo, Giuseppe Maschio

Risk Assessment of NaTech scenarios caused by flooding
Gabriele Landucci, A. Necci, Giacomo Antonioni, Valerio Cozzani

Preliminary earthquake risk perception: the case of secondary school students of a seismic region of Mexico
Galdino Santos-Reyas, Tatiana Gouzeva, Jaime R. Santos-Reyes

MONDAY, September 7, 2015, Parallel Sessions

13:40 - 15:00

D 5.2

SAFETY OF AIR TRAFFIC OPERATIONS

Chairman: Rui Kang

Airport operations safety assessment with the use of colored Petri nets
Jacek Skorupski

Quality assessment of the traffic flow management process in the vicinity of the airport
Artur Florowski, Jacek Skorupski

An approach to assess safety of Automatic Dependent Surveillance systems considering aspects of integrity in positional data based on computational simulation
Daniel Baraldi Sesso, Lucio Flavio Vismari, João Batista Camargo Junior

Modeling of aircraft during take-off and landing operations using artificial neural networks
Paulina Stańczyk, A. Stelmach

D 7.1

NUCLEAR PROBABILISTIC SAFETY ASSESSMENT: APPLICATIONS I

Chairman: Andrija Volkanovski

Sensitivity analysis of critical assumptions and methods applied in Armenian NPP fire probabilistic safety assessment model
Shahen Poghosyan, Gurgen Kanetsyan, Armen Amirjanyan, Remy Bertrand, Fabienne Nicoleau

Technical Issues of PSA for Korean Multi-Unit Nuclear Power Plants
Kyemin Oh, Seungho Jung, Gyunyoung Heo, Seung-cheol Jang

Risk based prioritization and management of relevant ageing components
S. Martorell, Isabel Martón, P. Martorell, S.Carlos, A.I. Sánchez

RAM based metrics for safety assessment of safety systems with application to ageing management
S. Martorell, Isabel Martón, P. Martorell, S.Carlos, A.I. Sánchez

D 7.2

HUMAN FACTORS: APPLICATIONS

Chairman: Stig Johnsen

Operator discourse analysis as a tool for risk management
Edmara dos Santos Drigo, Salvador Ávila Filho, Carlos Roberto Oliveira de Sousa

Decision support by integration of hazard analysis results in HMI
Annett Pfeffer, Leon Urbas

Evaluation of ATEX-HOF Methodology: A Case Study in Automotive Manufacturing Industry
Jie Geng, Salvina Murè, Gianfranco Camuncoli, Alberto Petruni, M. Cvetkovic, S. Nikolic, Micaela Demichela

Use of aggressor profiling in cyber security risk assessments for industrial control systems
Anders Dahlen Lauvsnes, Håkon Dahl-Olsen, Craig Aaen-Stockdale, Linda Sørensen

F 5

REMAINING USEFUL LIFE PREDICTION I

Chairman: Piero Baraldi

Integrated dynamic predictive maintenance planning with advanced deterioration and remaining useful lifetime estimation models
D. M. Lucke, T. Adolf, Thanh Trung Le, Ch. Bérenguer, J. Christien, S. Sieg-Zieba, R. Haug

Residual lifetime estimation and electronic device
Thomas Santini, Sebastien Morand, Florent Miller, Bruno Fucher, Mitra Fouladirad, Antoine Grall, Bruno Allard

Study on Life Assessment Technology for Marine Intermediate Bearing
Yanlei Wang, L. Liu

Lithium-ion Battery Remaining Useful Life Prediction Based on Grey Support Vector Machines
Jie Qiong Miao, X. Li, J. Liu, C. Peng

F 7

BAYESIAN NETWORKS I

Chairman: Katrina Groth

Maritime Accidents Risk Prediction Based on Bayesian Network with Interval Probabilities
Guizhen Zhang, Van Vinh Thai

A Bayesian Network for extreme river discharges in Europe
Dominik Paprotny, Oswaldo Morales Nápoles

Bayesian network-based models for bridge network management
Alex Kosgodagan, Oswaldo Morales-Nápoles, Johan Maljaars, Bruno Castanier, Thomas Yeung

Using Bayesian network analysis to determine the main accident risk factors in Spain
Susana García-Herrero, Miguel Ángel Mariscal, Antonio Cofiño, Jose Ramón López-García

MONDAY September 7, 2015

Parallel Sessions

15:20 - 17:00

E 5

RESILIENCE OF CRITICAL INFRASTRUCTURES: EXTERNAL EVENTS

Chairman: Seth Guikema

Characterization of present and future precipitation through bivariate copulas and its use in risk assessment of infrastructure
O. Morales-Nápoles, D. Worm, L. Abspoel-Bukman, J.N. Huibregtse, W. Courage

Water Supply Investment Decision-Making Under Climate Change Variability - New York City Case Study
Asmerom M. Gilau

Study of Seismic Recovery and Resilience of Electric Power Supply System
Li Sun, Max Didier, Božidar Stojadinović

Seismic Reliability of Urban Water Distribution Networks
Alessandro Rasulo

Probabilistic analysis of cascading events triggered by fire
Gabriele Landucci, Francesca Argenti, Alessandro Tugnoli, Valerio Cozzani

Impact of Wind Power on the Reliability of Electric Power Supply System
Cen Nan, Giovanni Sansivini

E 3

STRUCTURAL RELIABILITY I

Chairman: Bruno Sudret

Reliability-based expression for the shear capacity of reinforced concrete slabs under concentrated loads close to supports
Eva Lantsoght, C. Van der Veen, A De Boer

Modelling of the service life of concrete structures under combined mechanical and environmental actions
Martina Šomodíková, Břetislav Teplý, Dita Vořechovská, David Lehký

Probabilistic working life prediction of cooling towers
Jana Markova

Comparative probabilistic analysis for reinforced solid concrete slabs
Tatyana Micic, Milos Asenov

A computational framework for the reliability of offshore wind turbines support structures
Alexandre Morató Casademunt, Srinivas Sriramula, Nandakumar Krishnan

Structural reliability assessment using Direct Optimized Probabilistic Calculation with respect to the statistical dependence of input variables
Petr Janas, Martin Krejsa, Vlastimil Krejsa, Radim Briš

D 1.1

COMPONENT RELIABILITY MODELS

Chairman: Xiaoyang Li

Time-dependent covariates in the Transformed Gamma degradation process
Massimiliano Giorgio, Maurizio Guida, Gianpaolo Pulcini

Estimation for the parmeters of the q-Weibull distribution by maximum likelihood and particle swarm optimization
Isis Didier Lins, Enrique López Droguett, Romero Sales Filho, Márcio das Chagas Moura

Stress-Strength Reliability Estimation Based on q-Exponential Distribution
Romero Sales Filho, Enrique López Droguett, Isis Didier Lins, Márcio das Chagas Moura

Reliability modeling of a spool valve considering dependencies among failure mechanisms
Mengfei Fan, Zhiguo Zeng, Rui Kang, Enrico Zio

Research on Technological System of Equipment Prognostic Capability Verification
Zhiao Zhao, Jing Qiu, Guanjun Liu , Kehong Lv, Yong Zhang, Shuming Yang

D 1.2

IT AND TELECOMMUNICATION SYSTEMS II

Chairman: Elena Zaitseva

Fault-Tolerant Topology Selection for TTEthernet Networks
Voica Gavrilut, Domitian Tamas-Selicean, Paul Pop

Reliability Assessment of Wireless Sensor Networks for Environmental Detection
Rabih Kassan, Eric Châtelet, Bachar El Hassan, Ahmad Sardouk

Safety and reliability of data transmission over public networks
Dariusz Laskowski, Radoslaw Wielemborek, Piotr Lubkowski

On the probability of crossing the line -in wireless networks
Christian Tanguy, Mikhail Aristarkhov

An Application oriented Layered Index method for Satellite Constellation Reliability Evaluation
Wang Xuewang, Yi Li, Wang Zongren

D 3.2

QUANTITATIVE RISK AND RELIABILITY ASSESSEMENT - MARITIME INDUSTRY

Chairman: Shayan Kavakeb

The influence of wake fraction coefficient determination accuracy on the propulsion system operating parameters
Emilia Skupień

Risk assessment of ship-to-ship transfers by ANFIS modelling
Dimitrios Stavrou, Nikolaos Ventikos

Maritime risk assessment in inland waterways: the past and the future
Xinping Yan, Di Zhang, Jin Wang, Carlos Guedes Soares

What is a ship? Ship categories and application of AIS data and accident statistics for normalization of ship risk
Elisabeth Hansson Blix, Rolf Johan Bye, Eivind Kleiven, Petter Almklov, Trond Kongsvik, H. Gaseidnes, V. Berntsen

The research of KD-tree based ICP algorithm for fast data searching in bank modeling
Wang XiangLong, Xie Lei, X. Ai, S. Wang, J. Liu

AFTERWARDS 17:10 - 18:00, AUDI MAX (televised in E5)
Keynote: Prof. Dr. Nassim Taleb (NYU)

15:20 - 17:00

D 5.2

RISK ANALYSIS: NEW CONCEPTS FOR AEROSPACE

Chairman: Sam Cromie

Managing the Risk of Change: A New Approach
Siobhán Corrigan, Nick Mc Donald, Daniele Baranzini, Pernilla Ulfvengren

Concurrent Safety Analysis: A Method for Information Exchange between Systems and Safety Engineers
Axel Berres, Holger Schumann, Holger Spangenberg

Towards a Realist Validation of an Aviation System Operational Concept
Mark Alexander Sujan, Giuseppe Frau, Nick McDonald

Risk Prediction & Risk Intelligence in Aviation – the next generation of aviation risk concepts from PROSPERO FP7 Project
Daniele Baranzini, Massimiliano Zanin

DTO "Design To Operability" of Space Survey Complex System Monitoring
Charles Elegbede, Christophe Ducamp

D 7.1

NUCLEAR PROBABILISTIC SAFETY ASSESSMENT: APPLICATIONS II

Chairman: Sebastián Martorell

PSA Contribution in Development and Application of Severe Accident Management Guidelines
Pavlin Groudev, Petya Petrova, Emil Kichev, Kaliopa Mancheva

RAMI and PSA application for efficiency of fusion device
Robertas Alzbutas, R. Voronov

Application of WinPRAISE code for secondary side piping break frequency assessment in PSA
Shahen Poghosyan, Gurgen Kanetsyan, Armen Amirjanyan, John E. Ramsey, Peter Kohut

The Risk Analysis of Processing of Power Plant Radioactive Sludge into Low-Temperature Matrices
Lubos Kotek, Petr Travnicek, Petr Junga, Stepan Svoboda

Dust explosion of solid/solid mixtures: application to nuclear decommissioning
Miriam D'Amico, Olivier Dufaud, Laurent Perrin, Sophie Trelat, Jean-Claude Latché

Developing safety requirements on spent fuel pool island during the decommissioning of nuclear power plant
Hong Kyungchan, Kim Jonghyun, Oh Seungjong

D 7.2

F 5

PREVENTIVE MAINTENANCE STRATEGIES

Chairman: Christophe Berenguer

A new preventive maintenance strategy for warranted products considering customer satisfaction
Yukun Wang, Yiliu Liu, Zixian Liu

Optimization of load balance of man-hours in Preventive Maintenance planning with flexibility in date of execution
Rene Wladimir Tapia

A mathematical model for scheduling preventive maintenance and renewal projects of infrastructures
Farzad Pargar

K-out-of-N systems: design, operation and preventive maintenance
Jaroslav Zajicek, J. Kamenicky

Modified Periodic Replacement with used items at stochastic failure: Focusing sustainability and profit advantages
Mohamed-Larbi Rebaiaia, Daoud Ait-Kadi, M.A. Jamali, C. Mascle

F 7

COMPLEXITY IN SOCIO-TECHNI-CAL-ECONOMIC SYSTEMS

Chairman: Wolfgang Kröger

Modelling interdependent electric power and gas networks in the context of cascading failures
Olivier Gomand, Andrea Antenucci, Bing Li, Giovanni Sansavini

Risk-Informed Emergency Response via Spatio-Temporal Socio-Technical Risk Analysis
Justin Pence, Zahra Mohaghegh, Ernie Kee

Local Success, Global Failure: Challenges Facing the Recovery Operations of Critical Infrastructure Breakdowns
Alexander Cedergren, Jonas Johansson, Linn Svegrup, Henrik Hassel

Preliminary analysis of the effects caused by the eruption of the „Eyjafjallajökull" volcano in 2010
Jaime Santos-Reyes, Alan N. Beard

Towards Unified Perron-Frobenius Framework for Managing Systemic Risk in Networked Systems
Vladimir Marbukh

AFTERWARDS 17:10 - 18:00, AUDI MAX (televised in E5)
Keynote: Prof. Dr. Nassim Taleb (NYU)

TUESDAY September 8, 2015

Parallel Sessions

08:30 - 09:50

E 5

CRISIS AND EMERGENCY MANAGEMENT: ENHANCING RESILIENCE
Chairman: Stian Antonsen

Bridging the gap between long-term planning and short-term requirements: A risk-based perspective
Havard Fridheim, Gunn Alice Birkemo, Frode Rutledal

Enhancing Organizational Resiliece Through Virtual Communities of Practice
Raquel Gimenez, Leire Labaka, Josune Hernantes

Resilience in a Multilevel Crisis Governance Context: A tale of joint implementation of community, regional, national and EU response capabilities
B. I. Kruke, C. Morsut

Recovery of urban socio-technical systems after disaster: the reactive mechanism of planning and implementation
Vasily Lubashevskiy, Taro Kanno, Kazuo Furuta

E 3

STRUCTURAL RELIABILITY II
Chairman: Gilles Defaux

Development of Region-based Reliability Design for Reinforced Concrete Structural Elements
I. A. Assakkaf, S. Al-Sanad, M. Al-Saffar

Effect of the properties of the masonry buildings on their allowable settlements
Jamil Serhal, Olivier Deck, Marwan Alheib, F. Hage Chehade, Dalia Abdelmassih

Model uncertainty for resistances of steel members
Vitali Nadolski, Miroslav Sykora

Reliability assessment of towers and masts
Jana Markova, Milan Holicky

D 1.1

SYSTEM RELIABILITY: NETWORK SYSTEMS
Chairman: Jhon Andrews

Effects of link weights uncertainties in network community detection: Application to two electric power systems
Claudio Rocco, Jose Emmanuel Ramirez-Marquez, Jose Moronta, Dante Gama Dessavre

Layered Complex Networks Fault Propagation Effects Research Based on Cellular Automata
Dawei Xu, Guangyan Zhao, Yufeng Sun

Optimizing paths for networks with multi-objective functions
Natsumi Takahashi, Hisashi Yamamoto, Tomoaki Akiba, Xiao Xiao, Koji Shingyochi

Community Detection and Infrastructure Criticality
Giulio Galvan, Jitendra Agarwal

D 1.2

FUNCTIONAL SAFETY AND SAFETY-RELATED SYSTEMS I
Chairman: Anne Barros

Functional Safety for Safety-related Systems: 10 Common Mistakes
Florent Brissaud, Didier Turcinovic

Safety Instrumented Systems operated in the Intermediate Demand Mode
Siegfried Eisinger, Luiz Fernando Oliveira, Kristine Tveit, Bent Natvig

New PFD Calculation Method for Complex Scenarios -part 1: a hybrid method for handling maintenance mobilization time
Peiqing Zhang

Optimization of SIL allocation for Safety Functions Implemented over Layers of Protection
Edin Alijagic

D 3.2

OCCUPATIONAL SAFETY: RISK MANAGEMENT
Chairman: Paolo Bragatto

~~**Non-safety costs: a proposal of reclassification to facilitate the estimate of the economic consequences of occupational injuries**~~
~~Guido J.L. Micheli, Enrico Cagno, Veronica Ferrandi~~

Occupational Risk Management for activities performed near vehicles
Olga Aneziris, Ioannis Papazoglou, Myrto Konstandinidou, M. Damen, Linda J. Bellamy, M. Mud, H.J. Manuel, J. Oh

A framework for preventing and managing risks in confined spaces through IOT technologies
Lucia Botti, Vincenzo Duraccio, Maria Grazia Gnoni, Cristina Mora

Beyond trade-offs: towards a theory of the linkages between OHS and productivity
Paolo Trucco, Cristina De Capitani

AFTERWARDS 10:10 - 11:00, AUDI MAX
Keynote: Prof. Dr. Didier Sornette (ETH Zurich)

TUESDAY, September 8, 2015, Parallel Sessions

08:30 - 09:50

D 5.2

RISK AND RELIABILITY MANAGEMENT: RAILWAYS

Chairman: Ulrich Weidmann

Application of an Agile Development Processes for EN50128/railway conformant Software
Thor Myklebust, Tor Stålhane, Narve Lyngby

A pragmatic approach to the elicitation of RAMS-requirements based on experiences from railway infrastructure projects
Rune Winther, André Hauge, Christian Raspotnig

Harmonized methodology for Safety Integrity Level allocation in a generic TCMS application
Kiswendsida Abel Ouedraogo, Julie Beugin, El-Miloudi El-Koursi, Joffrey Clarhaut, Dominique Renaux, Frédéric Lisiecki

A Pragmatic Approach to the Reuse of Qualitative Risk and Reliability Analyses – Experiences from Analyses of Railway Traction Substations
Rune Winther

D 7.1

NUCLEAR PSA: AREA AND EXTERNAL EVENTS

Chairman: Heiz-Peter Berg

First Applications of the OECD FIRE Database within Fire probabilistic safety assessment for Nuclear Power Plants in Germany
Marina L. Roewekamp, Michael Türschmann, Heiz-Peter Berg, W. Werner, A. Werner

Automatic Integration of a Fire probabilistic safety assessment Model in Level 1 probabilistic safety assessment
Joachim Herb, Siegfried Babst, Joachim von Linden, Gerhard Mayer, Marina Röwekamp, Michael Türschmann

Integrated PRA methodology to advance fire risk modeling for nuclear power plants
Tatsuya Sakurahara, Seyed Reihani, Zahra Mohaghegh, Mark Brandyberry, Ernie Kee, Shawn Rodgers, Mary Anne Billings, David Johnson

Aircraft Crash External Events Analysis: The Impact of Aircraft Flight Phases Delineation on NPP Risk Assessment
Dusko Kancev, Stefan Heussen, T. Kozlik, Jens-Uwe Klügel

D 7.2

HUMAN AND ORGANIZATIONAL FACTORS: OIL AND GAS I

Chairman: Ron Boring

Importance of cognitive human factors in the safety management for petroleum industry
Stig Ole Johnsen, Yuanhua Liu

Case study of HF workload assessment on control rooms for offshore flotel rig
Yuanhua Liu, Stig Ole Johnsen

Leadership teams; Evaluation of a Risk Decision Making Method for total operational risk management of activities on offshore installations
H. von Hirsch-Maclean, O. H. Utvik, K. H. Dalland, R.I.Einarsen, T. A. Eide

Human and organizational factors in offshore oil and gas exploration and production facilities
Myrto Konstantinidou, Michalis Christou

F 5

REMAINING USEFUL LIFE PREDICTION II

Chairman: David Valis

Application of interval-valued probabilities and unified scheme of non-homogeneous Poisson process models to software failure prognostics
Victor G. Krymsky, Igor V. Ivanov

Jump Markov Linear Systems for deterioration modeling and Remaining Useful Life estimation
Thanh Trung Le, Florent Chatelain, Christophe Berenguer

Predicting remaining useful life by fusing SHM data based on Extended Kalman filter
Yiwei Wang, Christian Gogu, Nicolas Binaud, Christian Bes

The estimation and prognosis of failure behaviour in product fleets within the usage phase - RAPP method
Stefan Bracke, Sebastian Sochacki

F 7

BAYESIAN NETWORKS II

Chairman: Oswaldo Morales-Nápoles

Risk Assessment of Artic drilling waste management operations based on Bayesian Networks
Yonas Zewdu Ayele, Javad Barabady, Enrique López Droguett

Enhanced Bayesian Network approach to sea wave overtopping hazard quantification
Silvia Tolo, Edoardo Patelli, Michael Beer

Overview of methods to build conditional probability tables with partial expert information for Bayesian belief networks
Lusine Mkrtchyan, Luca Podofillini, Vinh N. Dang

AFTERWARDS 10:10 - 11:00, AUDI MAX
Keynote: Prof. Dr. Didier Sornette (ETH Zurich)

TUESDAY September 8, 2015

Parallel Sessions

11:10 - 12:30

E 5

CRISIS AND EMERGENCY MANAGEMENT: CRITICAL INFRASTRUCTURES

Chairman: Peter Burgherr

Preparedness of critical infrastructure subjects in energy sector for crisis situations

Alena Oulehlova, Hana Malachova, Oldrich Svoboda, Jiri F. Urbanek

Accident and Incident Investigation and Modelling in Critical Infrastructure

Jiri F. Urbanek, Alena Oulehlova, Hana Malachova, Oldřich Svoboda, Jiří J. Urbánek

Integration of resilience capabilities for critical infrastructures into the emergency management set-up

Igor Kozine, Henning Boje Andersen

Issues concerning identification of Critical Infrastructure systems within the Baltic Sea area

Przemyslaw Dziula, Krzysztof Kolowrocki, Adam Rosinski

E 3

STRUCTURAL RELIABILITY III

Chairman: Jana Markova

Application of soft computing techniques for reliability calculation of time demanding problems

Martina Šomodíková, David Lehký

Structural reliability assessment using Direct Optimized Probabilistic Calculation with respect to the statistical dependence of input variables

Petr Janas, Martin Krejsa, Vlastimil Krejsa, Radim Briš

Stochastic analysis of the lateral beam buckling of beams with initial imperfections

Zdeněk Kala, Jan Valeš

Reliability simulation analysis, evaluation and optimization on the conventional steering gear structure

Ning Zhang, Tingwei Liu, Hongwu Xu, Liang Zhang, Li Tian

Reliability-based expression for the shear capacity of reinforced concrete slabs under concentrated loads close to supports

Eva Lantsoght, C. Van der Veen, A De Boer

D 1.1

SYSTEM RELIABILITY: MULTI-STATE AND NETWORK SYSTEMS

Chairman: Joanna Soszynska-Budny

System dynamic modeling for multi-state systems

Hadi Akbarzadeh Khorshidi, Indra Gunawan, Yousef Ibrahim

Reliability analysis of multi-state systems using random set theory

Yunhui Hou, Mohamed Sallak, Walter Schön

Network robustness analysis based on current road incident data

Rostislav Vodák, Richard Andrášik, Michal Bíl, Jiří Sedoník

D 1.2

FUNCTIONAL SAFETY AND SAFETY-RELATED SYSTEMS II

Chairman: Edin Alijagic

Analytical formulas of PFD calculation for reliability assessment of systems with non-constant failure rates

Elena Rogova, Gabriel Lodewijks, Mary Ann Lundteigen

Safety Integrity Level- Tool: Software Calculation Tool to Determine the important Safety Parameters which based on IEC 61508 Standard

Ossmane Krini, Jamal Krini, Abderrahim Krini, Josef Börcsök

Application of an approach for traceability during safety systems development project documentation

Vikash Katta, Christian Raspotnig, Tor Stålhane

PFDavg and PFH formulas for SIS subject to partial and full periodic tests

Fares Innal, Yiliu Liu, Mary Ann Lundteigen, Marvin Rausand, Anne Barros

D 3.2

OCCUPATIONAL SAFETY: IMPROVEMENTS

Chairman: Myrto Konstantinidou

A safety incentive system based on workers behaviour and calculated through a fuzzy inference system

Ada Saracino, Giacomo Antonioni, Gigliola Spadoni, Matteo Mario Antonino Curcuruto, Dina Guglielmi, Marco Giovanni Mariani

Improved safety procedures for small chemical companies

Paolo Angelo Bragatto, Patrizia Agnello, Silvia Maria Ansaldi, Annalisa Pirone

Effective implementation measurability in a health and safety management system

Augusto Bianchini, Filippo Donini, Marco Pellegrini, Cesare Saccani, Mirko Fanelli

A Control Banding approach customized for the construction industry

Effie Marcoulaki, Myrto Konstandinidou, Ioannis A. Papazoglou, Marianna Dimaki

TUESDAY, September 8, 2015, Parallel Sessions

11:10 - 12:30

D 5.2

QUANTITATIVE RISK AND RELIABILITY ASSESSEMENT: AEROSPACE

Chairman: Rui Kang

Fuzzy expert inference system for selected aircraft on-board unit reliability evaluation. Initial project analysis
Józef Żurek, Norbert Grzesik

A quantitative risk assessment approach of IMA structure considering the cascading impact
Fuchun C. Ren, Lei Chen, Tingdi D. Zhao, Youchao C. Sun

Reliability Modeling Method of Space Mechanism Based on Considering Dynamical Cascading Effects
Pidong Wang, J. G. Zhang, L. J. Kan, L. F. You, L. Zhang, C. L. Tan, Y. Q. Liu

PRA based satellite risk analysis in orbit insertion and attitude establishment process
Zhaoguo Zhang, Jingyan Wang, Liang Li, Zhuo Cheng

D 7.1

VISUALISATION IN RISK ANALYSIS

Chairman: Lesley Walls

The role of data visualization in Railway Big Data Risk Analysis
Miguel Figueres-Esteban, Peter Hughes, Coen Van Gulijk

A simplified GIS-based tool for the environmental human health risk assessment in complex sites
Maria Francesca Milazzo, Giuseppa Ancione, Roberto Lisi

Information visualization to support a decision-making process on risk assessment
Thalles Vitelli Garcez, Marcelo Hazin Alencar, Adiel Almeida

D 7.2

HUMAN AND ORGANIZATIONAL FACTORS: OIL AND GAS II

Chairman: Stig Johnsen

A Cognitive deficit analysis in routine tasks, as a strategy to reduce accidents and increase of industrial production
Salvador Avila Filho, Cristiano Costa

Exploring cognitive biases in project development in the petroleum industry
Yuanhua Liu, Jan Tore Ludvigsen

Improving ICT Tools as Support for Morning Meetings in the Oil and Gas Industry
Amund Lågbu, Sizarta Sarshar, Grete Rindahl

A new Human and Organizational Factors model for assuring well control
Robert William Miles

F 5

MAINTENANCE: RAILWAY SYSTEMS

Chairman: Olga Fink

Application of a maintenance engineering decision method for railway operation: managing fleet performance, cost and risks
Pauline Poot-Geertman, Bob Huisman, Cyp Van Rijn

Delayed Maintenance Modelling with Speed Restriction for a Railway Section
Hui Shang, Christophe Berenguer, John Andrews

Handling reliability big data: a similarity-based approach for clustering a large fleet of assets
Francesco Cannarile, Michele Compare, Francesco Di Maio, Enrico Zio

RCM and Barrier modeling - Application of barrier analysis to railway rolling stock maintenance optimization
Terje Nilsen, Rolf-Arne Syvertsen

F 7

SOCIO-TECHNICAL SYSTEM MODELS I

Chairman: Zahra Mohaghegh

A logic-perspective flaw identifying method under the STAMP framework
Fuchun Ren, Deming Zhong, Lu Chen

Research on socio-technical system functional variability based on Functional Resonance Accident Mode
Juyi Wu, Jin Tian, Tingdi Zhao

Accident Analysis by Logic Programming Technique
Zobair Ibn Awal, Kazuhiko Hasegawa

An integral safety approach for design of high risk products and systems
Mohammad Rajabalinejad, G. Maarten Bonnema, F. J. A. M. van Houten

TUESDAY September 8, 2015

Parallel Sessions

13:40 - 15:00

E 5

CRITICAL INFRASTRUCTURES: NETWORK SYSTEMS

Chairman: Jose Ramirez-Marquez

Long-Term Optimization of Asset Replacement in Gas distribution Grids

Gido Brouns, Marco Poorts

Business continuity planning of Norwegian gas network

Linda Martens Pedersen, Bent Andre Ravdal

Bottleneck analysis of the gas transmission network using ProGasNet simulator

Vytis Kopustinskas, Pavel Praks

Assessing single point criticality of multi-modal transport networks at the national-scale

Raghav Pant, Jim W Hall, Simon P Blainey, John M Preston

E 3

UNCERTAINTY & SENSITIVITY ANALYSIS I

Chairman: Stefano Marelli

Reliability-based expression for the shear capacity of reinforced concrete slabs under concentrated loads close to supports

Eva Lantsoght, C. Van der Veen, A De Boer

Line Sampling approach for Extreme Case Analysis in presence of Aleatory and Epistemic Uncertainties

Edoardo Patelli, Marco de Angelis

Survival Signature-based Sensitivity Analysis of Systems with Epistemic Uncertainties

Geng Feng, Edoardo Patelli, Michael Beer

Copula-based Sensitivity Measures of Computer Experiments

Elmar Plischke, Emanuele Borgonovo

Making Importance Measures Robust

Emanuele Borgonovo

D 1.1

SYSTEM RELIABILITY OPTIMIZATION: MULTI-STATE SYSTEMS

Chairman: Jin Wang

A Novel Genetic Approach Developed on a Reduced Search Space for Optimal Redundancy Allocation in Multi-State Series-Parallel Systems

Muxia Sun, Yanfu Li, Enrico Zio

A bi-objective dynamic model for multi-state weighted k-out-of-n system reliability

Hadi Akbarzadeh Khorshidi, Indra Gunawan, Yousef Ibrahim

Complex System Safety and Operation Cost Optimization

Krzysztof Kolowrocki, Joanna Soszynska-Budny

An Ordinal Optimization Approach to the Solution of Homogenous Redundancy Allocation for Multi-State Series-Parallel Systems

Yanfu Li, Enrico Zio

D 1.2

SIMULATION FRAMEWORKS FOR RAMS I

Chairman: Nicola Pedroni

Modelling of Maintenance and Inspection Policies for Marine Systems using Monte Carlo Simulation and Delay-Time Analysis

Daniel McNamara, Andrew Cunningham, Ramin Riahi, Ian Jenkinson, Jin Wang

Hybrid-Pair Modelling in Dynamic Reliability: Concepts, Tool implementation and Applications

Gabriele Manno, Alexandros Zymaris, Ferdinando Chiacchio, Lucio Compagno, Diego D'Urso

Stochastic dynamic analysis and reliability evaluation for a heeling vessel rolling in random beam seas

Wei Chai, Bernt Johan Leira, Arvid Naess

A discrete event simulation design for block-based maintenance planning under random machine usage

Bram de Jonge

D 3.2

OCCUPATIONAL SAFETY: ACCIDENT ANALYSES

Chairman: Olga Aneziri

Using accident precursor events for supporting a dynamic risk analysis at lean workplace

Serena Andriulo, Maria Grazia Gnoni, Vincenzo Duraccio

Comparison of two methodologies for occupational accidents pre-cursors data collection

Lorenzo Comberti, Gabriele Baldissone, Serena Bosca, Micaela Demichela, Salvina Mure, Alberto Petruni, Marko Djapan, S. Cencetti

The risk of occupational accident: updating the Fuzzy Application Procedure

Salvina Murè, Gabriele Baldissone, Micaela Demichela, L. Comberti

Reasons for occupational accidents in road-building construction sites

Atiye Bilim, Niyazi Bilim, Osman Nuri Çelik

TUESDAY, September 8, 2015, Parallel Sessions

13:40 - 15:00

D 5.2

QUANTITATIVE RISK AND RELIABILITY ASSESSEMENT: RAILWAYS I

Chairman: Coen Van Gulijk

Propagation of Uncertainty in Railway Signaling Risk Analysis

Jens Braband, Hendrik Schaebe

Mitigating the impacts of unreliable railway components on service availability and punctuality

Ambra Toletti, Ulrich Alois Weidmann

Interurban Rail Network Vulnerability Analysis: Case Study of Iran

Navid Khademi, Mohsen Babaei, Amirhossein Fani

D 7.1

SYSTEM RELIABILITY: NUCLEAR APPLICATIONS

Chairman: Marko Čepin

Reliability evaluation of power installation in NPP cooling system based on the Reliability Block Diagram

Huadong Mo, Yu Liu, Min Xie, Jiejuan Tong

Station Blackout and Nuclear Safety

Andrija Volkanovski, M. Peinador

Common Cause Failures in Discrete Dynamic Models: Theory and Applications in the Figaro Modelling Language

Roland Donat, Marc Bouissou

Time-dependent PSA model for emergency power system of nuclear power plant

Mieczysław Borysiewicz, Aleksej Kaszko, Karol Kowal, Sławomir Potempski

D 7.2

HUMAN FACTORS: AEROSPACE

Chairman: Pernilla Ulfvengren

Helicopter accident analysis using HFACS-HE

Helen Omole, G. H. Walker, S. Shappell

Altering the way key information is presented to overcome the detrimental effect of in-cabin aircraft noise (simulated) on recall performance

Brett Robert Charles Molesworth, Sandra Koh, Marion Burgess

Laying the basis for resilient human-robot interactions in future space exploration missions

Knut Robert Fossum, Brit-Eli Danielsen, Abdul Basit Mohammad, Stig Ole Johnsen

Supporting safety management systems of air traffic controllers by analyzing human-technical interactions

Bence Számel, Géza Szabó

F 5

PROGNOSTICS AND SYSTEM HEALTH MANAGEMENT: STRUCTURAL RELIABILITY I

Chairman: Bernt Leira

The second law of thermodynamics and degradation of materials

Mehdi Amiri, Enrique Lopez Droguett, Nagaraja Iyyer, M. Naderi

Composite Materials Reliability Assessment and Comparison

David Valis, Aneta Krzyzak

A Thermodynamic Entropy Based Approach for Fault Detection and Prognostics of Samples Subjected to Corrosion-Fatigue Degradation Mechanism

Anahita Imanian, Mohammad Modarres

Damage Precursor Based Structural Health Monitoring and Damage Prognosis Framework

Elaheh Rabiei, Enrique Lopez Droguett, Mohammad Modarres, Mehdi Amiri

F 7

RISK ANALYSIS: INSURANCE AND FINANCE SECTORS

Chairman: Marco Broccardo

A Risk Management Approach for the Swiss Seismic Hazard

Panagiotis Galanis, Anastasia Sycheva, Marco Broccardo, Wanda Mimra, Božidar Stojadinović

The cost of reputational damage when a major accident occurs

Khine Kyaw, Nicola Paltrinieri

Contributions to meeting the Basel II AMA use test requirement

Hilde Brattebø Vormeland, David Häger

TUESDAY September 8, 2015

Parallel Sessions

15:20 - 17:00

E 5

EXTREME WEATHER EVENTS ON POWER SYSTEMS

Chairman: Royce Francis

Space weather impact on power grids
Roberta Piccinelli, Elisabeth Krausmann

Evaluating the impact of climate change on the risk assessment of nuclear power plants
Ullrika Sahlin, Francesco Di Maio, Matteo Vagnoli, Enrico Zio

Assessing the sensitivity of power distribution systems in U.S. metropolitan areas to climate-induced hurricane impacts
Andrea Staid, Seth D. Guikema, Roshanak Nateghi, Michael Z. Gao, Steven M. Quiring

A Bayesian Method For Thermo-Electric Power Generation Drought Risk Assessment
Behailu Bekera, Royce A. Francis

Online Reliability Calculations of Power Systems with Forecasted and Real Time Weather Influence
Trond Tollefsen, Arne Brufladt Svendsen, Robert Fossmark Pedersen, Paul Skeie, T.M. Lunde, J. Mælan

E 3

QUANTITATIVE RISK AND RELIABILITY ASSESSMENT: CONSTRUCTION INDUSTRY

Chairman: Eleni Chatzi

Reliability and Availability Prediction Calculations for Ventilation in Gotthard Base Tunnel
Dominique Huber, Markus Steiger, Nicola Norghauer

Resilience to hazards in district heating systems
Bożena Babiarz

Numerical simulation of Suspension footbridge focused on Human Comfort criteria
Jiri Kala

Application of a simple biomechanical model of a pedestrian in the solution of the dynamic response of a light bridge structure
Tomas Hanzlik, Vlastislav Salajka, Jiri Kala

Structural reliability analysis of heat production considering changeable external conditions
Bożena Babiarz, Agnieszka Blokus-Roszkowska

D 1.1

RELIABILITY DATA

Chairman: Tim Bedford

A review of safety valve reliability using failure fraction information
Jon Tømmerås Selvik, Eirik Bjorheim Abrahamsen

Application of Vendor Data in Assessment of Safety Instrumented Functions in the Oil and Gas Industry
Ragnar Aarø, S.L.Isakse, E.Kvam, I.B.Nilsen, M. H. Saltnes, A.V.Thaulow

Contribution for detection of long-time product reliability problems in the use phase based on analysis of data gathered in online communities
Stefan Bracke, Philipp Tursch, Ralf Woll, Philipp Temminghoff

Qualitative and quantitative analysis of uncertainties in the reliability analysis of field data within the product usage phase
Marcin Hinz, Sebastian Sochacki, Christoph Rosebrock, Stefan Bracke

Impact of reliability data quality on risk-based decision making
Stefan Landsverk Isaksen, C.P. Lundtofte

D 1.2

SYSTEM RELIABILITY: DYNAMIC FTA

Chairman: Durga Rao Karanki

Dependability analysis of Level Crossing Systems using a fuzzy dynamic fault tree approach
Jaouad Boudnnaya, Mohamed Sallak, Abdelhak Mkhida

A dynamic fault tree method for availability assessment of the repairable gas transmission system
Guanghao Zhu, Yufeng Sun, Guangyan Zhao

Quantitative analysis of Dynamic fault tree by probabilistic approach
Zineb Simeu-Abazi, Eric Gascard, Y. Sidqi

Advanced Fault Tree Synthesis for Systems with Dynamic Aspects
Nidhal Mahmud

Failure Root Causes Analysis of Complex Systems - Dynamic Fault Tree Approach
Eric Gascard, Zineb Simeu-Abazi

D 3.2

RISK ANALYSIS: HEALTHCARE

Chairman: Vinh Dang

Staff Perceptions of Incident Reporting & Organisational Learning in Healthcare – Results of a Qualitative Study
Mark Alexander Sujan, Giuseppe Frau

Risk of morbidity after surgeries at different operation techniques
Radim Bris, Zaneta Miklova, Lubomir Martinek

Does a national incident reporting system contribute to improved patient safety: a Norwegian case
Stine Skaufel Kilskar, Line Melby, Anita Øren, Jan Wilhelm Lippestad

A method for human reliability analysis in radiotherapy - identification and characterization of influencing factors
Dhruv Pandya, Luca Podofillini, Frank Emert, Antony J. Lomax, Vinh Dang

Risk Assessment in Radiotherapy and Patient Safety
Debbie Bray Gilley, Ola Holmberg

AFTERWARDS 17:10 - 18:00, AUDI MAX
Keynote: ESRA Plenary Session

15:20 - 17:00

D 5.2

SYSTEM RELIABILITY: OIL AND GAS

Chairman: Nicola Paltrinieri

System Reliability of Offshore Gas Turbine Engines with Erroneous Data Conditions
Lokukaluge Prasad Perera, Anders Valland, Mario M. Machado, Diego A. P. Manguinho

Modeling Life Extension of Safety Critical Systems
John D. Andrews, Claudia Fecarotti

Reliability Analysis of Safety Systems Subject to Multiple Testing Levels
Siegfried Eisinger, Luiz Fernando Oliveira, Luciana Moreira Chame, Joaquim Domingues Amaral Netto, Raphael Fernandes

Production Availability Modeling of FPSO System using Stochastic Petri Nets
Huixing Meng, Leïla Kloul, Antoine Rauzy

Economic Evaluation of Small-Scale LNG Production System for Shale Gas Recovery considering Life Cycle Cost with Availability
Juwon Kim, Y. Seo, S. Lee, D. Chang

D 7.1

NUCLEAR PROBABILISTIC SAFETY ASSESSMENT: APPLICATIONS III

Chairman: Marina Röwekamp

Use of Custom Software Applications for PSA Model Data Collection, Analysis, and Results Visualization
Davide Mercurio, Mark B. Wishart, Ed F. Parsley

Developing safety requirements on spent fuel pool island during the decommissioning of nuclear power plant
Hong Kyungchan, Kim Jonghyun, Oh Seungjong

An approach to address probabilistic assumptions on the availability of safety systems for deterministic safety analysis
Sebastián Martorell, I. Martón, A. Lázaro, F. Sánchez, J.F. Villanueva, S. Carlos, A.I. Sánchez

Probabilistic Analysis for the Handling of Radioactive Material
Bastian Alt, Heiko Kollasko, Jens-Uwe Klügel, Pascal Steiner

Probabilistic Safety Assessment of Cold Shutdown and Refuelling States: Method Development and Plant Operating States Definition
Marko Cepin, Ziva Bricman Rejc

The Risk Analysis of Processing of Power Plant Radioactive Sludge into Low-Temperature Matrices
Lubos Kotek, Petr Travnicek, Petr Junga, Stepan Svoboda

D 7.2

SAFETY OF AUTONOMOUS SYSTEMS

Chairman: Ingrid Bouwer Utne

Training and evaluation of a learning-based autonomous unmanned aircraft for collision avoidance: virtual training data generation
Thiago Toshio Matsumoto, Lucio Flavio Vismari, João Batista Camargo Junior

Reducing risk in aquaculture by implementing autonomous systems and integrated operations
Ingrid Bouwer Utne, Ingrid Schjølberg, Ingunn Marie Holmen

Risk modeling of autonomous underwater vehicle operation focusing on the human operator
Christoph Alexander Thieme, Ingrid Bouwer Utne, Ingrid Schjølberg

Application of Fuzzy Logic for Safe Autonomous Subsea IMR Operations
Jeevith Hegde, Ingrid Bouwer Utne, Ingrid Schjølberg, Brede Thorkildsen

Safety requirements for integrating Remotely Piloted Aircraft Systems in civil airspace
Michael Andersen Lundsveen, John Eidar Simensen, Christian Raspotnig

F 5

MAINTENANCE OPTIMIZATION

Chairman: Mitra Fouladirad

A Decision on Replacement Policy of Systems Subjected to Imperfect Repairs Using Multi-Objective Genetic Algorithms and Discrete Event Simulation
Rafael Valença Azevedo, Márcio C. Moura, Isis D. Lins, Enrique L. Droguett

A comparison of different maintenance grouping strategies for multi-component systems
Hai Canh Vu, Anne Barros, Phuc Do

Sparing for availability and sparing for confidence - use for cloud computing services
Amir Segal, Yizhak Bot

Oil quality and system maintenance optimisation
David Valis, Libor Zak, Jiří Chaloupka

An exponential smoothing extension method for restraining the end effect of local mean decomposition
Jiali Pan, Minghong Han

F 7

SOCIO-TECHNICAL SYSTEM MODELS II

Chairman: Elisa Ferrario

Using GIS to integrate social factors with level 3 PRA for emergency response
Ian Miller, Justin Pence, Zahra Mohaghegh, James Whitacre, Ernie Kee

Advances in Consequence Modeling
Randolph L. Sullivan

Geo-information infrastructures for inter-disciplinary risk analysis research
Vassilios Vescoukis, Panagiotis Galanis, Ionut Iosifescu, Lorenz Hurni, Martin Raubal

Safety of complex critical facilities – concept, assignment of conditions and timing management
Dana Prochazkova

Comparing operations in nuclear and railways based on a socio-technical system model
Heinz-Peter Berg, Stephan Griebel, Birgit Milius

AFTERWARDS 17:10 - 18:00, AUDI MAX
Keynote: ESRA Plenary Session

WEDNESDAY September 9, 2015

Parallel Sessions

08:30 - 09:50

E 5

SYSTEM RELIABILITY: ELECTRIC GRID

Chairman: Jona Johansson

A Framework of Model Predictive Control for the Safety Analysis of an Electric Power Microgrid
Fangyuan Han, Ionela Prodan, Enrico Zio

Smart Grid Substation Availability Assessment: Recovered MSS-based Approach
Eugene Brezhnev, Vyacheslav Kharchenko, German Fesenko, Vitaly Levashenko, Elena Zaitseva

Age-dependent uncertainty in energy network reliability assessment
Tomas Iesmantas, Robertas Alzbutas

Grid reliability assessment for short-term planning
Gamze Dogan, Pierre-Etienne Labeau, J.-C. Maun, J. Sprooten, M. Galvez, K. Sleurs

E 3

UNCERTAINTY & SENSITIVITY ANALYSIS II

Chairman: Edoardo Patelli

Integration and verification of confidence bounds in Monte Carlo reliability simulation
Volker Schweizer, Peter Zeiler, Bernd Bertsche

Component reliability allocation and demonstration test planning based on system reliability confidence limit
Peter Zeiler, Bernd Bertsche

Global Sensitivity analysis based on a Monte Carlo simulation: a study based on a natural gas system
Cristina Medeiros, Marcelo Hazin Alencar, Thalles Vitelli Garcez, Adiel Almeida

New Uncertainty Importance Measure for Probabilistic Safety Assessment
Davide Mercurio, Eric A. Thornsbury

D 1.1

SYSTEM RELIABILITY: MULTI-STATE SYSTEMS

Chairman: Yanfu Li

Reliability of maritime ferry technical system – Monte Carlo simulation assessment
Krzysztof Kołowrocki, Ewa Kuligowska, Joanna Soszyńska-Budny

Reliability of maritime ferry technical system – analytical assessment
Krzysztof Kołowrocki, Ewa Kuligowska, Joanna Soszyńska-Budny

Multistate System Reliability Models with Independent and Dependent Redundancy Application in Port Transport
Bozena Kwiatuszewska-Sarnecka

Reliability Prediction for multi-failure-state products based on Fuzzy Bayesian Network
Jinyong Yao, Hongzhi Li

D 1.2

SUPPLY CHAIN AND LOGISTIC SYSTEMS: DISRUPTION RISK

Chairman: Paolo Trucco

Disruptions and supply chain risk management in offshore logistics: a case study
Jaap van Rijckevorsel, Are Kristoffer Sydnes, Bjørn Morten Batalden

Modelling and simulation of disruption risk in the complex logistic networks – a multimethod approach
Lech Bukowski, Jerzy Feliks, K. Majewska

Synthesis of issue pertaining to the resilience of logistics systems
J. Swieboda, Mateusz Zajac

Supply chain vulnerability assessment methods – possibilities and limitations
Tomasz Nowakowski, Sylwia Ewa Werbinska-Wojciechowska, Maciej Chlebus

D 3.2

AFTERWARDS 10:10 - 11:00, AUDI MAX
Keynote: Mr. Pierre-Alain Graf (SwissGrid)

WEDNESDAY September 9, 2015, Parallel Sessions

08:30 - 09:50

D 5.2

QUANTITATIVE RISK AND RELIABILITY ASSESSEMENT: RAILWAYS II

Chairman: Sebastian Klabes

Approach for evaluating the safety of a satellite-based train localisation system through the extended integrity concept
Cyril Legrand, Julie Beugin, El-Miloudi El-Koursi, Juliette Marais, Marion Berbineau, Blaise Conrard

Modelling railway service reliability in the event of failures
Claudia Fecarotti, John Andrews, R. Remenyte-Prescott

A contribution to safety analysis of railway CBTC systems using Scola
Melissa Issad, Leila Kloul, Antoine Rauzy

Big Data Risk Analysis for Rail Safety
Coen van Gulijk, Peter Hughes, Miguel Figueres Esteban, Marcus Dacre, Chris Harrison

D 7.1

HUMAN RELIABILITY ANALYSIS: MODELS

Chairman: Jinkyun Park

Modelling Adequacy of Organisation in Human Reliability Analysis – A Case of Marine Engineering Operations
K. M. Abujaafar, Zaili Yang, Jin Wang, S. Nazir, K. I. Overgard

Operator Actions in NPP: Adjustment of Human Error Probabilities in Case of Earthquake
Dusko Kancev, Stefan Heussen, T. Kozlik, Jens-Uwe Klügel

Framework for a Bayesian Network Version of IDHEAS
Kilian Zwirglmaier, Daniel Straub, Katrina M. Groth

Dynamic context evaluation of human actions in severe accident analysis and management
Gueorgui Petkov, Emil Kostov, Kalin Filipov, Antoaneta Stefanova, Boriana Atanasova, Marina Andreeva, Pavlin Groudev

D 7.2

IMPROVING MARITIME SAFETY: THE SEAHORSE PROJECT

Chairman: Paul Liston

A Method to assess maritime system resilience
Jouke Rypkema, Dolf Van der Beek, Jan Maarten Schraagen, J.W. Winkelman, M. van Wijngaarden

Organisational requirements to transfer and implement safety solutions across operational contexts
Marco Ducci, Sara Silvagni, Paul Liston

SEAHORSE Project: Dealing with Maritime Workarounds and Developing Smarter Procedures
R. E. Kurt, V. Arslan, O.Turan, Louis de Wolff, B. Wood, O. Arslan, T. Kececi, J. W. Winkelman, M. van Wijngaarden, G. Papadakis

F 5

PROGNOSTICS AND SYSTEM HEALTH MANAGEMENT: STRUCTURAL RELIABILITY II

Chairman: Mohammad Modarres

Outline of the method for determination of the fatigue life on the basis of density function distribution for a number of fatigue cycles
Mariusz Michał Zieja, Michał Jasztal, Sławomir Stępień, Mariusz Ważny

Assessment of the probability of failure-free operation of the working system of small-dimension hydraulic hammers - a case study
Marek Sokolski, Piotr Sokolski

Analysis of variable acceleration factor in internal and external field salt spray tests
Guilin Zhang, Xiaohui Wang, Liwei Sun

Fatigue Life Prediction Based on Artificial Neural Networks
Zhangmin Bao, Wei Zhang, Shan Jiang, Fuqiang Sun

F 7

RISK MANAGEMENT: OIL AND GAS I

Chairman: Roger Flage

Integrated Asset Integrity Management: Risk Management, Human Factor, Reliability and Maintenance integrated methodology applied to subsea case
Eduardo Calixto

Risk information for operational decision making in oil and gas operations
Stein Haugen, J.E. Vinnem, O. Brautaset, R. J. Bye, O. M. Nyheim, J. Seljelid, B. R. Wagnild

An indicator approach for managing drilling risk in real time
Eivind Halvard Okstad, Stein Hauge, Torgeir Kolstø Haavik

Atmospheric dense gas dispersion models and their influence in the risk analysis studies assessment in the scope of the standard CETESB P4.261
Marcio Piovezan Salazar, Marcelo Ramos Martins

AFTERWARDS 10:10 - 11:00, AUDI MAX
Keynote: Mr. Pierre-Alain Graf (SwissGrid)

WEDNESDAY September 9, 2015

Parallel Sessions

11:10 - 12:30

E 5

SAFETY AGAINST FIRE EVENTS

Chairman: Mario Fontana

Troubleshooting techniques for life and fire safety in buildings
Eugen Nachtigall

Characterization of the flammability of household materials subjected to high radiative flux
Chloë Vincent, Laurent Aprin, Claire Longuet, Gilles Dusserre, Laurent Ferry, Guillaume Rambaud, Filippo Sabatini

Fire Safety Barrier Availability Analysis
José Augusto Sobral, Carlos Guedes Soares

Study of Leakage of Natural Gas and Distribution of Explosive Mixture in Building
Ales Tulach, Miroslav Mynarz, Milada Kozubkova

E 3

UNCERTAINTY & SENSITIVITY ANALYSIS III

Chairman: Katerina Konakli

Main features of the tool SUSA 4.0 for uncertainty and sensitivity analyses
Martina Kloos

Uncertainty propagation for rockfall hazard modelling: comparison of Monte-Carlo propagation method and Hybrid approaches
Guillaume Dupouy, Franck Bourrier, Jean-Marc Tacnet

Sensitivity analysis of parameters influencing solute transport from a deep repository of spent nuclear fuel
Josef Chudoba

Applications of Global Sensitivity Analysis Methods in Civil Engineering
Zdenek Kala

D 1.1

D 1.2

SUPPLY CHAIN AND LOGISTIC SYSTEMS I

Chairman: Tomasz Nowakowski

Proposition use some logistics tools to analyses the economic costs of accidents
Krzysztof Lewandowski

Concept reliability model of the passenger service at the Wroclaw Airport landside area
Artur Kierzkowski, Tomasz Kisiel

Maintenance strategy for transport systems telematics
Miroslaw Siergiejczyk, Adam Rosinski

Reliability of the cut flowers' supply chain
M. Nowakowska, Agnieszka Anna Tubis

D 3.2

SIMULATION FRAMEWORKS FOR RAMS II

Chairman: Michele Compare

Comparison of probability distributions for use in reliability and maintainability simulation
Jacobus Krige Visser

Haruspex: a Suite to Assess and Manage ICT Risk by Simulating Threat Agents
Fabrizio Baiardi, Federico Tonelli, Daniela Pestonesi, Valentino Angeletti

Sequential Monte Carlo Method to Assess the Availability of Power Station Layouts with Generator Circuit-Breakers
Vincenzo Figliuzzi, Francesco Cadini, Enrico Zio, Mirko Palazzo

A Spark-Based Monte Carlo Parallel Simulation Approach for Complex Large Systems Reliability Assessment
Yan Liu, Yi Ren, Linlin Liu, Zili Wang

WEDNESDAY September 9, 2015, Parallel Sessions

11:10 - 12:30

D 5.2

CRISIS AND EMERGENCY MANAGEMENT

Chairman: Randy Sullivan

DISPATMO Project: A framework for crisis management

Geoffrey Suliga, Vincent Idasiak, Frederic Kratz

On a New Regulation for Municipal Emergency Preparedness in Norway

Kinga Wasilkiewicz, Anita Øren, Eirik Albrechtsen, Petter Grytten Almklov, Abdul Basit Mohammad

Comprehensive Approach: an appropriate tool to gain security in the new wars and complex emergencies?

Lillian Katarina Stene, Bjørn Ivar Kruke

Competent crisis plan for crisis management of municipalities and complex facilities

Dana Prochazkova, Jan Prochazka, Angela Santos, L. Carvalho

D 7.1

HUMAN RELIABILITY ANALYSIS: DEPENDENCE ANALYSIS

Chairman: Katrina Groth

Improved Modelling and Quantification of Human Dependence

Ned Hickling

Complex Human-machine System Unsuccess Evolution Analysis

Dan Lee, Qiang Feng, Zili Wang, Yiran Chen

Symptom-based context evaluation of human performance and convergence of HEAP into its HPLV

Gueorgui Ivanov Petkov

A Dynamic Approach to Modeling Dependence Between Human Failure Events

Ronald Laurids Boring

D 7.2

SAFETY CULTURE: ENHANCING SAFETY

Chairman: Nora Balfe

Fighting the "normalization" of deviance. Slow drift analysis

J. P. Bert, Fabrice Jubert

Human-Performance Tools as Means to Promote System Resilience

Ann Britt Skjerve, Christer Axelsson

Improving Outage Control Centre team performance through design approach

Lars Hurlen, Pierrig Le Darz

A Total Safety Management framework in the case of a major hazards plant producing pesticides

Olga Aneziris, Zoe Nivolianitou, Myrto Konstantinidou, Ioannis Papazoglou, George Mavridis

F 5

PROGNOSTICS AND SYSTEM HEALTH MANAGEMENT: STRUCTURAL RELIABILITY III

Chairman: Enrique Lopez Droguett

Reliability analysis of nonlinear degradation processes with measurement errors

Songhua Hao, Jun Yang, Yu Zhao

Computation Methods for Extremes of Non-linear Multi-component Response

Bernt Leira

On Bayesian approaches for real-time crack detection

Roberto Rocchetta, Matteo Broggi, Edoardo Patelli, Quentin Huchet

Dynamic stress responses and fatigue lives of cantilever beams subjected to high-kurtosis non-Gaussian random loadings

Hongwei Cheng, Jin'e Huang, Yanlei Wang, Yang Zhang

F 7

RISK MANAGEMENT: OIL AND GAS II

Chairman: Linda Martens Pedersen

Import-adjusted fatality rates for OECD countries caused by fossil fuel accidents

Rebecca Lordan, Matteo Spada, Peter Burgherr

Barriers - from safety studies to safety management

Elisabeth Blix, Ole Magnus Nyheim

Integrated project and functional safety management - a way to increased quality of safety instrumented system design

Håkon Dahl-Olsen, Anders Dahlen Lauvsnes, Trygve Leinum, Angel Casal

Safety management using RBPS to achieve excellence in Petrobras contracts

Carlos Alberto Camargo

WEDNESDAY September 9, 2015

Parallel Sessions

13:40 - 15:20

E 5

MODELLING INTERDEPENDENCIES AND CASCADES

Chairman: Giovanni Sansavini

Measuring the societal and multi-industry impact of cascading failures in power systems
Bing Li, Kash Barker, Giovanni Sansavini

Vulnerability Analyses of Interdependent Critical Infrastructures: Case study of the Swedish National Power transmission system and Railway system
Linn Svegrup, Jonas Johansson

Method for describing and analysing cascading effects in past events: Initial conclusions and findings
Jonas Johansson, Henrik Hassel, Alexander Cedergren, Linn Svegrup, Björn Arvidsson

On Lifetimes of Systems Having Interdependence and Cascading Effect
Hyunju Lee, Ji Hwan Cha

Simulation of the Post-Disaster Recovery Process of Urban Socio-Technical Systems
Taro Kanno, Takeru Suzuki, Kazuo Furuta

E 3

DECISION MAKING UNDER UNCERTAINTY

Chairman: Royce Francis

Uncertainty and strength of knowledge in QRAs
Vegard Larsen Tuft, Beate Riise Wagnild, Linda Martens Pedersen, Malene Sandøy, Terje Aven

Identification of the most critical pipes in the presence of imprecise information
Michele Compare, Alessandro Mancuso, T. Laakso, A. Salo, Enrico Zio

Optimal risk regulatory policy in the development of a geological disposal facility
Oscar Nieto-Cerezo, Edoardo Patelli, Michael Beer

Reliability Assessments and Remaining Life of Pipelines Subject to Combined Loadings using Random Markov Processes and Imprecise Probabilities
David A. Opeyemi, Edoardo Patelli, Michael Beer, Sviatoslav A. Timashev

Development of a Case Study for Eco-Industrial Park Deployment under Uncertainty
Elizaveta Kuznetsova, Enrico Zio

D 1.1

SYSTEM RELIABILITY II

Chairman: Nicolae Brinzei

Reliability Analysis of a Small Power Supply System with Load Points Operating in Normal and Emergency Modes
Jacek Malinowski

A new Availability Allocation Method
Abraham Almaw Jigar, Marry Ann Lundteigen, Yiliu Liu

Computing the reliability kernel in time-variant analysis
Antoine Brias

Reliability of large two-dimensional nanosystems
Krzysztof Kolowrocki, Mateusz Torbicki

Intermittent Fault's Signification and Formalization Model
Qinmu Shen, Jing Qiu, Guanjun Liu, Kehong Lv

D 1.2

SUPPLY CHAIN AND LOGISTIC SYSTEMS II

Chairman: Marek Młyńczak

The use of Multidimensional Comparative Analysis in the choice of transport means of transport for the army
R. Milewski, Tomasz Smal

Cost of reliability of the delivery in the last 100 meters
Krzysztof Lewandowski

Modeling and optimization of a launcher integration process
Christophe Nivot, Benoîte de Saporta, François Dufour, Jacques Béhar, Damien Bérard-Bergery, Charles Elegbede

An implementation of product lifecycle management into urban cable propelled transportation
Johannes Winter, Ignacio Sesma

Reliability analysis of conveyor belt with dependent components
Agnieszka Blokus-Roszkowska, Krzysztof Kołowrocki

D 3.2

IT SECURITY RISK ASSESSMENT

Chairman: Ralf Mock

Mitigating offshore and maritime cyber risks
Mate Jozsef Csorba

IT Contingency Planning for Cyber Disasters
Frank Moehle

Power Utility Automation Cybersecurity: IEC 61850 Specification of an Intrusion Detection Function
Maëlle Kabir-Querrec, Stéphane Mocanu, Jean-Marc Thiriet, Eric Savary

Risk analysis of cyber vulnerabilities in water distribution industrial control systems
Vikram Mohan Rao, Royce A. Francis

A Comparative Study on the Norwegian Cyber Security Strategy vs strategies in EU and the US – emerging cybersafety ignored
Stig Ole Johnsen

13:40 - 15:20

D 5.2

CRISIS AND EMERGENCY MANAGEMENT: HUMAN BEHAVIOR

Chairman: Zahara Mohaghegh

Response of Rescue System to an Extraordinary Event
Karolína Chmelíková, Lenka Maléřová, J. Sindler

Human Behavior in Disaster Situations: A Paradigm Change
Matthias Holenstein, Anna-Lena Köng

Organised behaviour in the Swedish fire and rescue service - a case study
Tove Frykmer, Christian Uhr, J. Bergström

Knowledge Based Strategies for Disaster Risk Reduction: a Knowledge Management Framework to Increase Understanding and Awareness of the Value of Prevention and Preparedness
Ouejdane Mejri, Giulia Pesaro

Planning for crisis response: the case of the population contribution
Bjørn Ivar Kruke

D 7.1

COMPONENT RELIABILITY: TESTS I

Chairman: Xiaoyang Li

Temperature Effect of Constant Amplitude Fatigue Test and Accelerated Life Evaluation Method Based on Energy Parameter
Kun Yi Cai, Xiaobing Ma,Yu Zhao

Nonlinear accelerated degradation analysis based on the general Wiener process
Le Liu, Xiao-Yang Li, Tong-Min Jiang

Efficiency comparison between step-down and step-up stress accelerated degradation tests based on Wiener process modeling
Wen Xi, Xiaobing B. Ma, Xiuting T. Liu

The life prediction on typical coatings of printed circuit board through accelerated degradation modeling
Liwei Sun, Xiaohui Wang, Guilin Zhang, Jinquan Xuan, Jian Gao

Highly Accelerated Stress Screening Efficiency Analysis Method Study Based on the theory of optimum
Manman Mu, Xiaohong Wang, Wenhui Fan, Yuxiang Lee, Jingquan Xuan

D 7.2

SAFETY CULTURE: GENERAL ISSUES

Chairman: Sam Cromie

Why measure safety climate? A longitudinal study on the relationship between safety climate measurements and safety performance
Asbjørn Gilberg, Robert Ekle, Rolf Johan Bye, Trond Kongsvik

Development of the framework for a Self-Assessment Tool to assess the effectiveness of reporting within a Safety Critical Industry
Ewan Douglas, Chiara Leva, Sam Cromie, Fabio Mattei

Learning from disaster – exploring new ways of seeing
Marie Damlie, Lisa Falch Nilsen, Stian Antonsen

Organisational Support for Human Performance: A Human Factors Capability Self-Assessment Tool
Nora Balfe, Maria Chiara Leva, Sam Cromie

Trends in Safety Culture: An Essay on Organizational Behaviors Influencing Safety, in the Light of Recent Developments in Oil & Gas Industry
Deshai Botheju, Kumuduni Abeysingha

F 5

DESIGN, VERIFICATION AND VALIDATION OF PHM SYSTEMS

Chairman: Christophe Berenguer

Introducing Type 5 to the NASA prognostics and health management classification scheme
Uwe Kay Rakowsky, Bernd Bertsche

Prognostics Health Management: Perspectives in Engineering Systems Reliability Prognostics
Manuel Antonio Marques Esteves, Eusebio Manuel Pinto Nunes

Development and reliability testing of a new filtering algorithm for noisy data from flight data recorder
Marta Kamila Woch, Wojciech Michał Zieliński

A Method for On-line Evaluating the Accuracy of a Particle Filter-Based Prognostic Approach
Yang Hu, Piero Baraldi, Francesco Di Maio, Enrico Zio

Reliability Model with Wiener process based on Objective Bayesian
Jing Yue Yang, Jun Yao, HongHua Hu, Longbo Liu

F 7

QUANTITATIVE RISK ASSESSESSMENT: OIL AND GAS I

Chairman: Siegfried Eisinger

Transient ignition modeling of gas leaks in enclosed modules
Knut Erik Teigen Giljarhus, M. M. Venkatraman, O. Spangelo, S. Jensen, G. R. Kumaresh, I. Fossan

Advanced Cryogenic Structural Collapse Analysis (CSCA) – Part I: Cryogenic flow modelling
Joaquim Pujol, Rune N. Kleiveland

Quantitative predictions of blowout events
Stefan Landsverk Isaksen, Beate Riise Wagnhild, Smarty Mathew John

Regionalized risk assessment of accidental oil spills using worldwide data
Peter Burgherr, Matteo Spada, Anna Kalinina, Paul Page

Risk assessment of oil and gas facilities during operational phase
Andreas Falck, Roger Flage, Terje Aven

WEDNESDAY September 9, 2015

Parallel Sessions

15:40 - 17:20

E 5

MODELLING INTERDEPENDENCIES AND CASCADES II

Chairman: Alexander Cedergren

Equal load-sharing models of cascades in network infrastructures
Antonio Scala, P. G. De Sanctis Lucentini

Cascading failure behaviors in randomly generated power transmission networks
Francesco Cadini, Alberto Azzolin, Enrico Zio

Assessing Supply Chain Vulnerabilities to Critical Infrastructure Disruptions: a multilevel modelling approach
Paolo Trucco, Boris Petrenj

Investigation method for cascading effects between critical infrastructures
Björn Arvidsson, Jonas Johansson, Henrik Hassel, Alexander Cedergren

Aggregating performance measures in interdependent infrastructure networks: issues and challenges
Allison Reilly, Seth Guikema, Andrew Samuel

E 3

DECISION MAKING UNDER DEEP UNCERTAINTY

Chairman: Ullrika Sahlin

Info-Gap Theory: An Intuitive Overview for Engineering Design and Reliability Assessment
Yakov Ben-Haim

What type of uncertainty is robustness referring to in Information Gap Decision Theory?
Ullrika Sahlin

Robust design of inspection schedules by means of probability boxes for structural systems prone to damage accumulation
Marco de Angelis, Edoardo Patelli, Michael Beer

Black Swan Events and Property Asset Management: Redefining Place and Space on Global Organisations Property Decisions
David Mark Higgins

Belief function theory based decision support methods: application to torrent protection work effectiveness and reliability assessment
Simon Carladous, Jean-Marc Tacnet, Jean Dezert, Mireille Batton-Hubert

D 1.1

COMPONENT RELIABILITY: TESTS II

Chairman: Xiaohong Wang

Simulation based optimal design for accelerated degradation test plan with multiple stresses and multiple degradation measures
Yashun Wang, Xun Chen, Chunhua Zhang, Yuanyuan Tan

Extensive Investigation of Calibrated Accelerated Life Testing (CALT) in Comparison with Classical Accelerated Life Testing (ALT)
Burak Sal, Mustafa Altun

The research on the resistance to soldering heat of molded epoxy solid tantalum chip capacitor
Zhibin Wang, Yan Chen, Xin Gong, Chao Duan, Qifeng Pan

Effects of ZnO varistor degradation on the overvoltage protection mechanism of electronic boards
Hadi Yadavari, Burak Şal, Mustafa Altun, Ertunç Nedim Ertürk, B. Ocak

Fatigue Life Prediction under Random Amplitude Loading Spectra with Shock
Shan Jiang, Wei Zhang, Jingjing He, Zili Wang

D 1.2

IT AND TELECOMMUNICATION SYSTEMS III

Chairman: Mark Zeller

Reliability modeling of open source software based on adoption behavior under stochastic environment
Amir Hossein Soleiman Garmabaki, Alireza Ahmadi, I. Mahdavi, Mahdieh Ahmadi

Applying a reliability metric for assessing computer-based logical diagrams
Bjørn Axel Gran, John Eidar Simensen

Reliability Analysis of the Controller Architecture in Software Defined Networks
Mario Di Mauro, Maurizio Longo, Fabio Postiglione

On data unavailability and file loss in coded data storage systems for the Cloud
Christian Tanguy, Mathieu Besson, Ruby Krishnaswamy, Antoine Grall

Proposal for Improvement of a Reliability Growth Model
Jamal Krini, Ossmane Krini, Abderrahim Krini, Josef Börcsök

D 3.2

DYNAMIC PROBABILISTIC SAFETY ASSESSMENT

Chairman: Vinh Dang

An entropy-driven method for exploring extreme and unexpected accident scenarios in the risk assessment of dynamic engineered systems
Pietro Turati, Nicola Pedroni, Enrico Zio

A Comparison of Dynamic Event Tree Methods: Initial Results for a Chemical Batch Reactor
Durga Rao Karanki, Vinh N Dang, Michael T. MacMillan, Luca Podofillini

A procedure to develop the EBEPU methodology merging PSA-based assumptions and BEPU method
Sebastián Martorell, A. Lázaro, I. Martón , F. Sánchez; J.F. Villanueva; S. Carlos, A.I. Sánchez

Dynamic Risk Assessment of Marine Systems
Børge Rokseth, Ingrid Bouwer Utne

Framework for assessing integrated site risk of small modular reactors using dynamic probabilistic risk assessment simulation
Matthew Dennis, Mohammad Modarres, Ali Mosleh

AFTERWARDS 19:00 - 23:00

Gala Dinner (at the Zurich Kongresshaus)

15:40 - 17:20

D 5.2

CRISIS AND EMERGENCY MANAGEMENT: TRAINING

Chairman: Stian Antonsen

How can the usefulness of capability assessments be improved?
Hanna Lindbom, Henrik Tehler, Tove Frykmer, Christian Uhr

Emergency Response Plans Using Time Scheduling to Anticipate the Mission Time Deviation
Clément Girard, Eric Piatyszek, Benoît Robert

Improvement of crisis exercise by the development of scenario design
P. Limousin, A. Bony-Dandrieux, Jérôme Tixier, Gilles Dusserre

Developing a tool to assess trainees during crisis management training for major risks
Dimitri Lapierre, A. Bony-Dandrieux, F. Tena-Chollet, G. Dusserre, J. Tixier

Motivating factors towards willingness to contribute in collaborative tasks: A crisis cooperation perspective
Roshni Pramanik, Henrik Hassel, Henrik Tehler

D 7.1

HUMAN RELIABILITY ANALYSIS NOVEL DOMAINS

Chairman: Slacka Prvakova

~~**Determination of Human Error Probabilities in Permit to Work Procedure**~~
~~Mehdi Jahangiri, N. Hobobi, Sareh Keshavarzi, Ali Akbar Hosseini~~

Human Reliability Analysis to support operational planning of an experimental facility
P. Buffa, M. Giardina, S. F. Greco, G. Palermo, V. Dang, L. Podofillini, J. Esposito, G. Prete

Adapting Human Reliability Analysis from Nuclear Power to Oil and Gas Applications
Ronald Laurids Boring

Proof-of-concept accident diagnostic support for sodium fast reactors
Katrina M. Groth, Matthew R. Denman, Thomas Jones, Michael Darling, George F. Luger

Risk Assessment and Optimization for New or Novel Processes: Combining Task Analysis with 4D Process Simulation – framework and case study
Marko Gerbec, Nora Balfe, Chiara Leva, Steve Prast, Micaela Demichela

Evaluation of Human Error of Response to Auditory and Visual Signals in the Virtual Reality
Lubos Kotek, Zdenek Tuma, Petr Blecha, Zuzana Nemcova, Petr Habada

D 7.2

QUANTITATIVE RISK ASSESSMENT: DIFFERENT DOMAINS

Chairman: Dana Prochazkova

Risk Analysis and Reliability Improvement on Spark Ignition Engines Associated to Sporadic Failures
João Carlos Salamani, Gilberto Francisco Martha de Souza

Quantifying system safety: A comparison of the SBOAT & Safety Barrier Manager tools
Zaza Nadja Lee Hansen, Nijs Jan Duijm, Frank Markert, Luke Herbert

Probabilities in Safety of Machinery – Elements of a Risk Model and Comparison with Field Data
Heinrich Moedden

Risk Assessment in the Perishable Food Supply Chain
Mohsen Shirani, Micaela Demichela

Influence of storage conditions of liquid fuels on functional parameters in the processes of long-term storage
Jacek Ryczyński

F 5

CONDITION-BASED AND PREDICTIVE MAINTENANCE

Chairman: Antoine Grall

Predictive maintenance of selected gas equipment using the RCM methodology
Jan Kamenicky, J. Zajicek

A low-cost predictive maintenance approach for E/E/PE dependable systems
Antonio Vieira da Silva Neto, Paulo Sérgio Cugnasca

Clustering condition-based maintenance for a multi-unit system with aperiodic inspections
Minou C. A. Olde Keizer, Ruud H. Teunter

A game-based optimization approach for fleet condition-based maintenance oriented to mission reliability
Qiang Feng, Yiran Chen, Dan Li, Yi Ren

Maintenance of a deteriorating control system based upon controller reconfiguration
Yves Langeron, Antoine Grall, Anne Barros

F 7

QUANTITATIVE RISK ASSESSESSMENT: OIL AND GAS II

Chairman: Eirik Bjorheim Abrahamsen

Risk control in the well drilling phase: BOP system reliability assessment
Geir-Ove Strand, Mary Ann Lundteigen

Dynamic barrier management: a case of sand erosion integrity
Nicola Paltrinieri, Stein Hauge, William R Nelson

Probabilistic Design Accidental Load for Fire Accidents in Offshore Topside Structures
Migyeong Kim, Gyusung Kim, J. Jung, W. Sim

Application of Biofilter Plantation for Oil Spill Cleanup in the Arctic Coastal Waters
Masoud Naseri, Abbas Barabadi, Javad Barabady, Grigorii Voskoboynikov

A General Approach for Automating FMECA
Michele Compare, Enrico Zio

AFTERWARDS 19:00 - 23:00
Gala Dinner (at the Zurich Kongresshaus)

THURSDAY September 10, 2015

Parallel Sessions

08:30 - 09:50

E 5

FOUNDATIONAL ISSUES IN RISK ASSESSMENT AND MANAGEMENT I

Chairman: Terje Aven, Enrico Zio

Risk - from concept to decision making
Andreas Hafver, David Volent Lindberg, Irena Jakopanec, Frank Børre Pedersen, Roger Flage, Terje Aven

A Framework for Conceptualizing the Performance of and Assessing the Risks to Systems
Roshanak Nateghi, Terje Aven

Risk assessment under deep uncertainty: a methodological comparison
Julie Shortridge, Terje Aven, Seth Guikema

Separating variability from uncertainty when treating critical assumptions in risk assessments
David Volent Lindberg, Andreas Hafver, Irena Jakopanec, Frank Børre Pedersen, Roger Flage, Terje Aven

E 7

MODEL UNCERTAINTIES I

Chairman: Enrique Lopez Droguett

Random Predictor Models for Rigorous Uncertainty Quantification: Part 1
Luis G. Crespo, Sean P Kenny, Daniel P. Giesy

Random Predictor Models for Rigorous Uncertainty Quantification: Part 2
Luis G. Crespo, Sean P. Kenny, Daniel P. Giesy

Probabilistic risk assessment considering parameter and model uncertainties
Florent Brissaud, Elsa Rosner

Coping with model uncertainty in optimisation of maintenance policy
Shaomin Wu, Frank Coolen

D 1.1

RISK AND RELIABILITY ANALYSIS: IMPROVING THE CLASSICS

Chairman: Jhon Andrews

Application of reliability methods - an empirical study
Florian Vincent Haase, Ralf Woll

Combined Use of Composition of Probabilistic Preferences and Entropy Weighting for Failure Mode Prioritization
Pauli A. A. Garcia, Vanessa da Silva Garcia, Pedro Luiz da Cruz Saldanha, Carlos Magno Couto Jacinto

Probabilistic Extension of Failure Net Based FMEA
Bernhard Kaiser, Matthias Rauschenbach

Environmental Effectiveness Ontology based method for Enhancing FMECA
Bo Sun, Yu Li, Qiang Feng, Yi Ren

D 1.2

SIMULATION FRAMEWORKS FOR RAMS III

Chairman: Antoine Rauzy

Mixed weibull distribution as best representative of forced outage distribution to be implemented in blocksim
Elisa Carlucci, Leonardo Tognarelli

Potentials of coloured Petri nets for realistic availability modelling of production systems in industry 4.0
Fei Long, Peter Zeiler, Bernd Bertsche

A simulation approach for risk modeling and analysis based on multi-agents
Hassan Kanj, Jean-Marie Flaus

Building Business Cases for Risk and Reliability Technologies
Vitali Volovoi

D 3.2

OCCUPATIONAL SAFETY: ASSESSMENT I

Chairman: Silvia Ansaldi

~~**Occupational health and safety in food seasoning sector**~~
~~Pinar Ercan, Bulut Mert~~

Occupational health and safety in aquaculture industry
Bulut Mert, Pinar Ercan

Technical Safety Maintenance Systems – An Integrative Approach
Philipp von Cube, J. Volmert, Robert Schmitt

Mobile Elevating Work Platforms: a discussion on the main causes of accidents and some suggestions for prevention
Elisabetta De Cillis, Luisa Maria Maida, Mario Patrucco, Corrado Cirio

AFTERWARDS 10:10 - 11:00, AUDI MAX
Keynote: ESRA Technical Committees

08:30 - 09:50

D 5.2

RISK MANAGEMENT I

Chairman: Dana Prochazkova

Modern approach for integrating Safety Events in a Risk Management process
Jari M Nisula

Reliability and Maintainability Impact to Asset management stakeholders: A practical guide for Asset Owners
Mohammad Raza

Risk management in freeze-drying process
Serena Bosca, Davide Fissore, Micaela Demichela, Rafael L. B. Raoni

Creating an Integrated Risk Picture for four modes of transport
Jari M Nisula

D 7.1

HUMAN RELIABILITY ANALYSIS: DATA

Chairman: Jonghuyun Kim

A framework to determine simulation scenarios for collecting HRA data from full-scope simulators
Jinkyun Park, Yochan Kim, Wondea Jung

Empirical investigation of relation between PSFs and HEPs regarding soft controls
Yochan Kim, Jinkyun Park, Wondea Jung, Inseok Jang

Use of a handheld tool to support control room and field operator collaboration
Magnhild Kaarstad, Stine Strand, Christer Nihlwing

Human error contribution to transient initiating event frequencies
A. Camarinopoulos, Olivier Nusbaumer, Leonidas Camarinopoulos, Günter Becker

D 7.2

SAFETY CULTURE AND CLIMATE

Chairman: Ann Britt Skjerve

Psychosocial Risks in Underground Systems
Carla Santos Fugas

Safety Culture in Quality Management System of the Organisation
Vera Pelantová

Human Factors in Situations of Uncertainty
Miguel Angel Mariscal Saldaña, Susana Garcia Herrero, Eva Maria López-Perea, Antonio Toca-Otero, Eduardo Obeso-Torices

A Difficulty of the Work on the Production Line
Vera Pelantová

F 5

PROGNOSTICS AND SYSTEM HEALTH MANAGEMENT: ENERGY INDUSTRY

Chairman: Mitra Fouladirad

The Continued Development of the MFM Suite and its Practical Application on a PWR System
Harald P-J Thunem, Xinxin Zhang

Review and analysis of SCADA data-based methods for health monitoring of wind turbines
Alexis Lebranchu, Sylvie Charbonnier, Christophe Berenguer, Frédéric Prevost

Data Analytics for Concrete Structural Health Monitoring in Nuclear Power Plants
Vivek Agarwal, Y. Bao, Sankaran Mahadevan, D. Adams, Bruce P. Hallbert

Unsupervised Ensemble Clustering for Transients Classification in a Nuclear Power Plant Turbine
Sameer Al-Dahidi, Francesco Di Maio, Piero Baraldi, Enrico Zio, Redouane Seraoui

F 7

AFTERWARDS 10:10 - 11:00, AUDI MAX
Keynote: ESRA Technical Committees

THURSDAY September 10, 2015

Parallel Sessions

11:20 - 12:40

E 5

FOUNDATIONAL ISSUES IN RISK ASSESSMENT AND MANAGEMENT II

Chairman: Roger Flage, Seth Guikema

Risk Management Methodology for Protecting Against Malicious Acts -Are Probabilities Adequate Means for Describing Terrorism and Other Security Risks?
Sissel Haugdal Jore, Anne Egeli

Identifying scientific principles for the concepts of societal safety and societal security
Sindre Høyland

Reviewing the state of knowledge on the societal safety and societal security concepts – an initial modelling effort
Sindre Høyland

Hazard/threat identification – using different creative methods to support the Anticipatory Failure Determination approach
Anders Jensen, Terje Aven

E 7

MODEL UNCERTAINTY II

Chairman: Oswaldo Morales-Nápoles

Comparison of Uncertainty Multilayer Models of Impact of Teleinformation Devices Reliability on Information Quality
Marek Stawowy, Przemyslaw Dziula

Nonparametric estimation of distributions of order statistics with application to nuclear engineering
Cristina Butucea, Jean-François Delmas, Anne Dutfoy, Richard Fischer

Model comparison and quantification of statistical uncertainties for annual maxima of ground snow loads
Árpád Rózsás, Miroslav Sýkora

Advanced Interval based Monte Carlo Method for atmospheric dispersion model in risk assessment
EL Abed El Safadi, Olivier Adrot, Jean-Marie Flaus

D 1.1

RISK AND RELIABILITY: AUTOMATING ANALYSES

Chairman: Nicola Pedroni

CONFeTTI - COmpoNent Fault Tree based TestIng
Mark Zeller, Kai Höfig

From HazOp study to automatic construction of Cause Consequence Diagrams for frequency calculation of hazardous plant states
Paolo Mario Contini, Sergio Contini, Sabrina Copelli, Renato Rota, Micaela Demichela

Automatic fault tree construction via component based and feature based modelling
Ashish Bhagavatula, Sarah Dunnett, Paul Bell, Jun Tao

D 1.2

SIMULATION FRAMEWORKS FOR RAMS IV

Chairman: Martina Kloos

Improving performances of the AltaRica 3.0 stochastic simulator
Benjamin Aupetit, Michel Batteux, Antoine Rauzy, Jean-Marc Roussel

Reliability Modeling of a Hybrid Car Drive System with advanced Petri Nets considering dependencies and aging
Timo Rieker, Peter Zeiler, Bernd Bertsche

An application of Quasi Monte Carlo methods for the numerical assessment of maintenance strategies
Jeanne Demgne, William Lair, Jérôme Lonchampt, Sophie Mercier

Assessment of the improvement achieved in RAMS by a FEV embedding a Powertrain PHMS
Beatriz Sedano García, D. Astigarraga, Piero Baraldi, M. Rigamonti, Enrico Zio

D 3.2

OCCUPATIONAL SAFETY: ASSESSMENT II

Chairman: Paolo Bragatto

Open Data by Public Administrations: an opportunity for improving research in occupational and industrial safety
Silvia Maria Ansaldi, Patrizia Agnello

Modelling mechanisms of vessel crew injury: A generalisable approach
Douglas Owen, Gemma Innes-Jones, Yasmine Hifi, Serena Palmieri, Luca Save

Occupational Health and Safety Outlook in Turkey
Niyazi Bilim, Atiye Bilim

Safe distance for firefighting in the protective zone of 400kV power lines
Martin Trcka, Adam Thomitzek, Barbora Baudisova, Jan Ondruch

THURSDAY, September 10, 2015, Parallel Sessions

11:20 - 12:40

D 5.2

RISK MANAGEMENT II

Chairman: Marko Čepin

Business continuity management using efficient qualitative methods

Ezani Schultheiss, Andreas Fischer

Management systems for safety in nuclear industries

Roland Akselsson

Communicating Hazard Log information to empower stakeholders and achieve increased safety

Øivind Spro Heggland, John Eidar Simensen

Resilience Analysis of Critical Infrastructures exposed to External Disturbances and affected by Uncertainty

Sameer Al-Dahidi, Xing Liu

D 7.1

HUMAN RELIABILITY ANALYSIS: DECISION ERRORS

Chairman: Luca Podofillini

Diagnosis Error Probability Estimation by Using Bayesian Inference in Advanced MCR HRA

Ar Ryum Kim, Inseok Jang, Poong-Hyun Seong, Jonghyun Kim, Jinkyun Park

An International Survey of Error of Commission Assessment: Methods and Practices

Ned Hickling, Les Ainsworth, Martin Reid

The Development of PSA Compatible Methods for the Identification of Errors of Commission (EOCs)

Ned Hickling, Alison Miller, Martin Reid

Human-Machine Interface (HMI) scenario quantification performed by ATHEANA, A Technique for Human Error Analysis

J. M. O. Pinto, P. F. Frutuoso e Melo, Pedro Luiz da Cruz Saldanha

D 7.2

SAFETY CULTURE: TRAINING

Chairman: Nora Balfe

Measures of orienting response for improving safety training

Evanthia Giagloglou, Milan Radenkovic, Marko Milosevic, Christos Tsiafis, Pavle Mijovic, Ivan Macuzic, Marko Djapan, Sasa Brankovic

Safety training system using virtual plant linked dynamic simulator

Atsuko Nakai, K. Suzuki

Enhancing the basis for Crew Resource Management (CRM) training for well operations crews: Risk Influencing Factors in Offshore Drilling

Sverre Andreas Kvalheim, Stein Haugen

Towards an Approach for Training Control-Room Crews in Handling Unforeseen Events

Ann Britt Skjerve, Lars Holmgren, Bjarne Widheden

F 5

FAULT DETECTION AND DIAGNOSIS I

Chairman: Piero Baraldi

~~**An inference exchange and decision fusing model for separated surveillance units in safety-critical infrastructure**~~

~~Yang Wang, Enrico Zio, Bing Wu, Di Zhang~~

The problem of sensor location for plant reconfiguration in nonlinear systems

Alexey Nil Zhirabok, A. Shumsky & A. Zuev, E. Bobko

Failure Detection for Flight Control Surface Based on the Information of Electric Actuator

Xiao Xiong, Jingyan Wang, P. Zhang

F 7

THURSDAY September 10, 2015

Parallel Sessions

13:50 - 15:10

E 5

FOUNDATIONAL ISSUES IN RISK ASSESSMENT AND MANAGEMENT III

Chairman: Terje Aven, Enrico Zio

On the appropriateness of using the ALARP principle in safety management
Håkon Bjorheim Abrahamsen, Eirik Bjorheim Abrahamsen

From theory to practice: itinerary of James Reasons' Swiss Cheese Model
Justin Larouzee, Franck Guarnieri

Risk in the Safety Sciences: Its Economic Foundations, its Hyperbolic Geometry, and its Engineering Methods
Max Mendel, Genserik Reniers, Pieter van Gelder

E 7

STATISTICAL METHODS FOR SMALL DATA SAMPLES

Chairman: Ullrika Sahlin

Robust Bayesian Estimation of System Reliability for Scarce and Surprising Data
Gero Walter, Andrew Graham, Frank Coolen

Validity Analysis of Reliability Evaluation Method under Small Sample and Random Censoring Data
An Wei Shen, Ji Lian Guo, Zhuo Jian Wang

Quantifying operational risk exposure by combining incident data and subjective risk assessments
Arne Bang Huseby, Jan Thomsen

Comparison of Weibayes and Markov Chain Monte Carlo methods for the reliability analysis of turbine nozzle components with right censored data only
Francesco Cannarile, Michele Compare, Sara Mattafirri, Fausto Carlevaro, Enrico Zio

D 1.1

DANGEROUS GOODS

Chairman: Valerio Cozzani

Comparison of Dutch and Russian standards for calculating physical effects of hazardous substances
Alexey Leksin, Uli Barth, Damir Adeulov, Ralf Mock

Transport of dangerous goods - research on activities carried out by the Voivodeship Road Transport Inspectorate
Paulina Krawczyszyn, Tomasz Smal

The Need for Harmonised Risk Acceptance Criteria for the Transport of Dangerous Goods in Europe
John Spouge, Jonathan Ellis

Risk assessment of Dangerous Good Transportation using Fuzzy Bow tie diagram analysis
Soha Saad, Ali Jaber, Jean-Marie Flaus

D 1.2

D 3.2

LIFE-CYCLE MANAGEMENT

Chairman: Marek Młyńczak

Development of a Whole Life Cost Model for Offshore Wind Farms
Mahmood Shafiee, Feargal Brennan, Ines Armada Espinosa

Integrated Logistic Support: RAM, preventive maintenance, inspection, spare parts and life cycle cost optimization based on Dynamic programming method
Eduardo Calixto, Yizhak Bot, Amir Segal

Concept of controlling for maintenance management performance. A case study of passenger transportation company.
Agnieszka Tubis, Sylwia Ewa Werbinska-Wojciechowska

Value of information in life cycle management of flood defences
Wouter Jan Klerk, Frank den Heijer, Timo Schweckendiek

AFTERWARDS 15:30 - 16:00, AUDI MAX
Closing session

THURSDAY, September 10, 2015, Parallel Sessions

13:50 - 15:10

D 5.2

D 7.1

HUMAN RELIABILITY ANALYSIS AND HUMAN FACTORS FOR DECISION SUPPORT

Chairman: Ron Boring

Guidance on integrating Human Reliability Assessment in Quantitative Risk Assessment

Koen van de Merwe, Sondre Øie, Sandra Hogenboom, Andreas Falck

Learning from accidents: analysis of multi-attribute events and implications to improve design and reduce human errors

Raphael Moura, Michael Beer, John Lewis, Edoardo Patelli, Franz Knoll

How HRA Can Drive Plant Improvement

Claire Taylor

Expert elicitation for assessing the effect of risk control options to reduce human error in winter navigation

Osiris A. Valdez Banda, F. Goerlandt, P. Kujala & J. Montewka

D 7.2

F 5

FAULT DETECTION AND DIAGNOSIS II

Chairman: Anne Barros

Model-based fault detection and isolation of PEM fuel cells using Bond Graphs

Andrey Vasilyev, Sarah J. Dunnett, Lisa M. Jackson

Development of a Fuzzy Diagnostic Model for Polymer Electrolyte Fuel Cells

Ben Davies, Lisa M. Jackson, Sarah J. Dunnett

An evolutionary decision support system for the top event early detection

Sebastiano Spampinato, Bruno Martino, Ferdinando Chiacchio, Lucio Compagno, Diego D'Urso

Electromechanical Servomechanisms Affected by Motor Static Eccentricity: Proposal of Fault Evaluation Algorithm based on Spectral Analysis Techniques

Dario Belmonte, Matteo Davide Lorenzo Dalla Vedova, Paolo Maggiore

F 7

RELIABILITY OF RENEWABLE ENERGY SYSTEMS

Chairman: Giovanni Sansavini

Reliability modeling and innovative maintenance strategies for offshore wind farms

Phong Tuan Nguyen, Johan Gyselinck, Pierre Etienne Labeau, Philippe Lataire, S. Verstraeten

Size fluctuation in energy demand for the electric market: the effect of renewable sources

Antonio Scala, G.Caldareli, M.Mureddu, A.Damiano

Risks and Reliability in a Fully Renewable Switzerland

Stuart John Bartlett, Albertus Christiaan Kruyt, Annelen Kahl, Michael Lehning

Impact of Wind Power on the Reliability of Electric Power Supply System

Cen Nan, Giovanni Sansivini

Risk Assessment of NaTech scenarios caused by flooding

Gabriele Landucci, A. Necci, Giacomo Antonioni, Valerio Cozzani

Probabilistic analysis of cascading events triggered by fire

Gabriele Landucci, Francesca Argenti, Alessandro Tugnoli, Valerio Cozzani

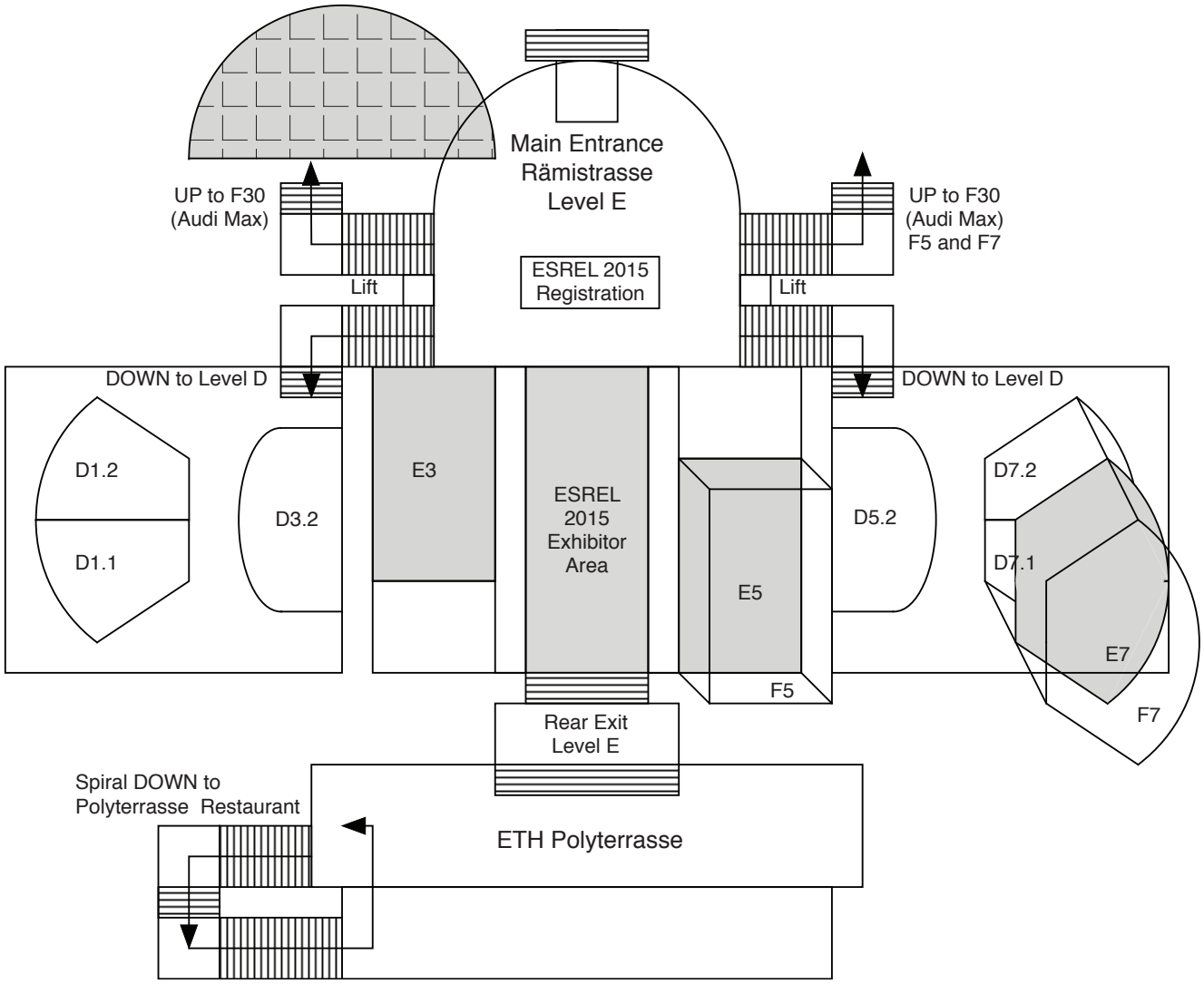
AFTERWARDS 15:30 - 16:00, AUDI MAX
Closing session

ESREL 2015 Technical Program Summary

		E5	E3 (E7 on Thu)	D1.1	D1.2	D3.2
Monday	10:50-12:30	ETH Risk Center: Resilient Infrastructure Systems Bozidar Stojadinovic	Surrogate models: structural reliability I Bruno Sudret	System reliability I Joanna Soszyńska-Budny	Model-based system engineering Antoine Rauzy	Natural hazards: quantification Pieter van Gelder
	13:40-15:00	Resilience assessment: across sectors Terje Aven	Surrogate models: structural reliability II Nicolas Gayton	Risk and reliability: importance measures Emanuele Borgonovo	IT and telecommunication systems I Ralf Mock	Natural hazards: vulnerability analysis Peter Burgherr
	15:20-17:00	Resilience of critical infrastructures: external events Seth Guikema	Structural reliability I Jean-Marc Bourinet	Component reliability models Xiaoyang Li	IT and telecommunication systems II Elena Zaitseva	QRA: Maritime Shayan Kavakeb
Tuesday	8:30-9:50	Crisis and emergency management: enhancing resilience Stian Antonsen	Structural reliability II Gilles Defaux	System reliability: network systems John Andrews	Functional safety and safety-related systems I Anne Barros	Occupational safety: risk management Paolo Bragatto
	11:10-12:30	Crisis and emergency management: critical infrastructures Peter Burgherr	Structural reliability III Jana Markova	System reliability: multi-state and network systems Joanna Soszyńska-Budny	Functional safety and safety-related systems II Edin Alijagic	Occupational safety: improvements Myrto Konstantinidou
	13:40-15:00	Critical infrastructures: network systems Jose Ramirez-Marquez	Uncertainty & sensitivity analysis I Stefano Marelli	System reliability optimization: multi-state systems Jin Wang	Simulation frameworks for RAMS I Nicola Pedroni	Occupational safety: accident analyses Olga Aneziri
	15:20-17:00	Extreme weather events on power systems Royce Francis	QRA and reliability: construction industry Eleni Chatzi	Reliability data Tim Bedford	System reliability: dynamic FTA Durga Rao Karanki	Risk analysis: healthcare Paolo Trucco
Wednesday	8:30-9:50	System reliability: electric grid Jonas Johansson	Uncertainty & sensitivity analysis II Edoardo Patelli	System reliability: multi-state systems Yanfu Li	Supply chain and logistic systems: disruption risk Paolo Trucco	
	11:10-12:30	Safety against fire events Mario Fontana	Uncertainty & sensitivity analysis III Katerina Konakli		Supply chain and logistic systems I Tomasz Nowakowski	Simulation frameworks for RAMS II Michele Compare
	13:40-15:20	Modelling interdependencies and cascades I Giovanni Sansavini	Decision making under uncertainty Royce Francis	System reliability II Nicolae Brinzei	Supply chain and logistic systems II Marek Młyńczak	IT Security Risk Assessment Ralf Mock
	15:40-17:20	Modelling interdependencies and cascades II Henrik Hassel	Decision making under deep uncertainty Ullrika Sahlin	Component reliability: tests II Xiaohong Wang	IT and telecommunication systems III Kai Höfig	Dynamic PSA Vinh Dang
Thursday	8:30-9:50	Foundational issues I Terje Aven and Enrico Zio	Model uncertainty I Enrique Lopez Droguett	Risk and reliability analysis: improving the classics John Andrews	Simulation frameworks for RAMS III Antoine Rauzy	Occupational safety: assessment I Slivia Ansaldi
	11:20-12:40	Foundational issues II Roger Flage and Seth Guikema	Model uncertainty II Oswaldo Morales-Nápoles	Risk and reliability: automating analyses Nicola Pedroni	Simulation frameworks for RAMS IV Martina Kloos	Occupational safety: assessment II Paolo Bragatto
	13:50-15:10	Foundational issues III Terje Aven and Enrico Zio	Statistical methods for small data samples Ullrika Sahlin	Dangerous goods Valerio Cozzani		Life-cycle management Marek Młyńczak

D5.2	D7.1	D7.2	F5	F7		
Accident analysis: transportation Valerio Cozzani	Risk governance and policy making Lesley Walls	Human factors: experimental Yuanhua Liu	Maintenance management Christophe Berenguer	Nuclear safety: perspectives Olivier Nusbaumer	10:50-12:30	Monday
Safety of air traffic operations Rui Kang	Nuclear PSA: applications I Andrija Volkanovski	Human factors: applications Stig Johnsen	Remaining useful life prediction I Piero Baraldi	Bayesian networks I Katrina Groth	13:40-15:00	
Risk analysis: new concepts for aerospace Sam Cromie	Nuclear PSA: applications II Sebastián Martorell		Preventive maintenance strategies Antoine Grall	Complexity in socio-technical-economic systems Wolfgang Kröger	15:20-17:00	
Risk and reliability management: railways Ulrich Weidmann	Nuclear PSA: area and external events Heiz-Peter Berg	Human and organizational factors: oil and gas I Ron Boring	Remaining useful life prediction II David Valis	Bayesian networks II Oswaldo Morales-Nápoles	8:30-9:50	Tuesday
QRA: aerospace Rui Kang	Visualization in Risk Analysis Lesley Walls	Human and organizational factors: oil and gas II Stig Johnsen	Maintenance: railway systems Olga Fink	Socio-technical system models I Zahra Mohaghegh	11:10-12:30	
QRA: railways I Coen Van Gulijk	System reliability: nuclear applications Marko Čepin	Human factors: aerospace Siobhan Corrigan	PHM: structural reliability I Bernt Leira	Risk analysis: insurance and finance Marco Broccardo	13:40-15:00	
System reliability: oil and gas Nicola Paltrinieri	Nuclear PSA: applications III Marina Röwekamp	Safety of autonomous systems Ingrid Bouwer Utne	Maintenance optimization Mitra Fouladirad	Socio-technical systems models II Elisa Ferrario	15:20-17:00	
QRA: railways II Sebastian Klabes	HRA: models Jinkyun Park	Improving maritime safety: the SEAHORSE project Paul Liston	PHM: structural reliability II Mohammad Modarres	Risk management: oil & gas I Roger Flage	8:30-9:50	Wednesday
Crisis and emergency management Randy Sullivan	HRA: dependence analysis Katrina Groth	Safety culture: enhancing safety Nora Balfe	PHM: structural reliability III Enrique Lopez Droguett	Risk management: oil & gas II Linda Martens Pedersen	11:10-12:30	
Crisis and emergency management: human behavior Zahra Mohaghegh	Component reliability: tests I Xiaoyang Li	Safety culture: general issues Sam Cromie	Design, V&V of PHM systems Christophe Berenguer	QRA: oil & gas I Siegfried Eisinger	13:40-15:20	
Crisis and emergency management: training Stian Antonsen	HRA: novel domains Ned Hickling	Quantitative risk assessment: different domains Dana Prochazkova	Condition-based and predictive maintenance Antoine Grall	QRA: oil & gas II Eirik Bjorheim Abrahamsen	15:40-17:20	
Risk management I Dana Prochazkova	HRA: data Jonghyun Kim	Safety culture and climate Ann Britt Skjerve	PHM: energy Industry Mitra Fouladirad		8:30-9:50	Thursday
Risk Management II Marko Čepin	HRA: decision errors Luca Podofillini	Safety culture: training Nora Balfe	Fault detection and diagnosis I Piero Baraldi		11:20-12:40	
	HRA and HFs for decision support Ron Boring		Fault detection and diagnosis II Anne Barros	Reliability of renewable energy systems Giovanni Sansavini	13:50-15:10	

RÄMISTRASSE



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