

PSAM 11 ESREL 2012

11th International Probabilistic Safety Assessment
and Management Conference
and
The Annual European Safety and Reliability Conference
Scandic Marina Congress Center, Helsinki, Finland
25–29 June 2012



PROGRAM



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Foreword

Dear colleagues,

It is our pleasure to welcome you to PSAM11 & ESREL 2012, jointly organized by the International Association of Probabilistic Safety Assessment and Management (IAPSAM) and the European Safety and Reliability Association (ESRA).

We hope the conference will provide an interesting platform for presenting and discussing developments and applications related to safety, reliability and risk assessment methods.

Following a number of successful meetings in the past, this year's conference program is a blend of ESREL – PSAM traditions and Nordic Footprints in the safety assessment field. The technical program comprises papers covering all of the major areas of reliability and risk assessment methods and applications, including nuclear, process and chemical industries, offshore and marine, space and aviation, civil engineering, financial management, information technology, medical technology, just to name a few. In addition to the typical PSAM & ESREL topics, we would like to draw your attention to several special sessions covering issues like Imprecise Probabilities, Passive Safety Systems, the Fukushima Accident and many others – no less than 25 altogether.

Originally, about 1000 abstracts were submitted. Following the review by the Technical Program Committee, approximately 750 full papers in 30 technical tracks were accepted and are included in the program. The work and effort of the peers involved in the Technical Program Committee in helping the authors to improve their papers are greatly appreciated. Special thanks go to the track leaders and organizers of the Special Sessions, for their work.

In addition to the technical sessions, each conference day includes a plenary session in the morning. The plenary talks cover topics ranging from important methodological issues in reliability and risk assessment to safety goals and major nuclear and offshore accidents.

Besides the technical program, the conference also offers an exhibition where you have the opportunity to learn about commercial products and services, and meet the conference sponsors.

At Tuesday luncheon, four "early career" individuals who have been active in the field of Risk Assessment will be awarded with the George Apostolakis Fellowship. The Honorary Chairman, Commissioner USNRC, George Apostolakis, will introduce the award-winning young scientists.

We would like to acknowledge the local organizer, STUK (Radiation and Nuclear Safety Authority), VTT (Technical Research Centre of Finland), Aalto University and the Finnish Nuclear licensees, Fortum and TVO, and the conference secretariat, CONGREX / Blue & White Conferences Oy, for their careful planning of the practical arrangements.

In addition to a versatile technical program, the meeting attendees have a unique opportunity to enjoy the Nordic "nightless nights" in Helsinki, the World Design Capital 2012.

Thank you for your participation in this conference and welcome to Helsinki.



Reino Virolainen
General Chair
Radiation and Nuclear Safety Authority (STUK)



Terje Aven
Technical Program Chair
University of Stavanger

Organizing Chairs

Honorary Chair

George Apostolakis, USNRC

General Chair

Reino Virolainen, STUK, Finland

Co-General Chairs

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Enrico Zio, Ecole Centrale Paris-Supelec, France &
Politecnico di Milano, Italy

Program Committee Chair

Terje Aven, University of Stavanger, Norway

Co-Program Committee Chairs

Kurt Petersen, Lund University, Sweden
Pekka Pyy, TVO, Finland
Kaisa Simola, VTT, Finland

Publication and Publicity Chair

Riikka Laitinen-Sorvari, STUK, Finland

IT Management Chair

Jarmo Huovinen, STUK, Finland

Local Committees

Local Organizing Committee

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Ilkka Niemelä (STUK)
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Jan-Erik Holmberg (VTT)
Veikko Rouhiainen (VTT)
Kaisa Simola (VTT)
Seppo Vuori (VTT)
Kalle Jänkälä (Fortum)
Risto Himanen (TVO)
Pekka Pyy (TVO)
Pentti Kujala (Aalto University)
Ahti Salo (Aalto University)
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Jarmo Huovinen (STUK)

IT Management

Jarmo Huovinen (STUK)
Juha Häikiö (STUK)
Ari Julin (STUK)
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Conference Secretariat

CONGREG / Blue & White Conferences Oy

Technical Program Committee

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John Andrews
Piero Baraldi
Anne Barros
Tim Bedford
Harold Blackman
Emanuele Borgonovo
Josef Börcsök
Carlo Cacciabue
Marko Cepin
Valerio Cozzani
Vinh Dang

Andy Dykes
Massimo Felici
Roger Flage
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Joan Harvey
Philippe Hessel
Risto Himanen
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Stig Johnsen
David Johnson
Tsu-Mu Kao

Dana Kelly
Michael Knochenhauer
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Gregory Levitin
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Luiz Oliveira
Philippe Palanque
Ioannis Papazoglou
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Teemu Reiman
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Ahti Salo
Michael Schwarz
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Stefano Tarantola
Jan Erik Vinnem
Ton Vrouwenvelder
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Tunc Aldemir
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Ragnar Andersson
Olga Aneziri
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Robert Bari
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Luca Podofillini
Florin Popentiu
M. Pourgol-Mohammad
Christian Preyssl
Jean Primet
Dirk Proske
Jari Puttonen
Emmanuel Raimond
Uwe Rakowsky
Maria Fernanda Ramalhoto
Daniel Rees
Bruce Reisle
Budhi Sagar
Martin B. Sattison
Hartmut Schmaltz
Gerhard Schoen
Bernd Schubert

Nathan Siu
Carlos Cuedes Soares
Anthony Spurgin
Andreas Strohm
Tor Stålhane
Atoosa Thunem
Harald Thunem
Pia Tint
Jiejuan Tong
Harri Tuomisto
Shane Turner
Kim Wallin
Jin Wang
Jussi Vaurio
Zdenek Vintr
Min Xie
Akira Yamaguichi
Joon Eong Yang
Robert Youngblood
Valerie Zille

Organizers and Sponsors



Exhibitors



The George Apostolakis Fellowship

This Fellowship is awarded to honor the singular contribution of George Apostolakis to the Science of Risk as well as his vision, energy and guidance generously given to IAPSAM.

The George Apostolakis Fellowship is to be awarded to an “early career” individual who is active in the field of Risk Assessment. We wish to identify an individual who may be one of tomorrow’s leaders in the advancement of probabilistic safety assessment and management.

A broad definition of “early career” is purposefully chosen. Candidates could be advanced undergraduates, graduate students, post graduate researchers or early career professionals. Candidates are to be nominated by a professor, a colleague or a supervisor.

The George Apostolakis Fellows will receive transportation allowance to attend the PSAM conference, complimentary participation, hotel accommodation during the conference, small stipend for incidental costs, a plaque commemorating the award and an honored place on the meeting agenda for a technical presentation.

It is intended that additional Fellows will be chosen for recognition at future PSAM meetings.



Dr. George Apostolakis
Commissioner of the U.S. Nuclear
Regulatory Commission (NRC)



Reece Clothier

Senior Research Fellow
Australian Research Centre for Aerospace Automation
Science and Engineering Faculty, Queensland University of Technology, Australia

[Presentations given by Reece Clothier:](#)
[21-We4-3](#) and [21-Th4-4](#)

Dr. Reece Clothier completed his Bachelor of Engineering majoring in Aerospace Avionics, with first class honours and the University Medal in 2004 at the Queensland University of Technology (QUT), Brisbane, Australia.

In 2006, Reece was one of only eight postgraduate students to be awarded a Queensland State Government Smart State PhD scholarship for his PhD research in the safe design and operation of Unmanned Aircraft Systems (UAS).

Reece initiated and is an active member of a number of industry forums for the development of safety regulations for civil UAS. He has chaired the Australian Aviation Industry Forum, Sub-Committee on UAS Certification and Regulation and is a member of the Civil Aviation Safety Authority, Standards Consultative Committee, Sub-Committee for the review of Regulations and Guidance Material for UAS (Project OS 11/20).

Reece has also consulted to industry on Australian airspace management and reform, has advised the Australian Department of Defence on matters relating to UAS airworthiness, and has developed quantitative risk assessment tools for the Defence Science and Technology Organisation. Through these and other initiatives, Reece has been able to practically apply his research to ensure the risk-informed development of safety regulations for UAS.

Dr. Clothier is also a strong advocate for the civil UAS industry. He is on the Steering and Technical Committees for the UAV Outback Rescue Challenge and was a founding Board Member of the Association for Unmanned Vehicle Systems – Australia.



Katrina Groth

Senior Member of Technical Staff in Risk and Reliability Analysis
Sandia National Laboratories in Albuquerque, NM, USA

[Presentations given by Katrina Groth:](#)
[16A-We3-3](#) and [02BS-Fr2-2](#)

Dr. Katrina Groth is a Senior Member of Technical Staff in Risk and Reliability Analysis at Sandia National Laboratories in Albuquerque, NM, USA.

Dr. Groth received her PhD in Reliability Engineering in 2009 from the University of Maryland. She also holds an MS in Reliability Engineering (2008) and a BS in Nuclear Engineering (2004) from the University of Maryland. At UMD, Dr. Groth worked with Professor Ali Mosleh in the area of Bayesian analysis, Probabilistic Risk Assessment, and decision making under uncertainty. Dr. Groth has authored or co-authored several conference and journal papers related to risk analysis in both nuclear power and aviation applications.

While at UMD, Dr. Groth participated in the development of a methodology and software package (Trilith) that extends traditional PRA to incorporate soft causal factors (such as human, software, and organizational risks), using Bayesian Belief Networks (BBNs). The methodology allows analysts to apply familiar risk metrics (e.g., importance measures, risk indicators) to non-deterministic system elements.

Dr. Groth's dissertation focused on improving human performance models used in nuclear power plant Human Reliability Analysis. Using a combination of available human performance data and expert models, she developed a BBN that can assess human error probability based on specific aspects of the context. This BBN is the first attempt to fully integrate a causal model of human performance into traditional PRA.

She is currently researching Bayesian statistical methods for aggregating various types of data (including subjective information) to produce a more robust human performance BBN. She hopes to reduce the difficulty of quantifying Bayesian Belief Networks, so they are more accessible for decision makers without advanced statistical expertise.



Brian Johnson

PRA Analyst
TerraPower, LLC, USA

[Presentations given by Brian Johnson:](#)
[16C-Th3-2](#)

Dr. Brian Johnson is a Probabilistic Risk Assessment (PRA) Analyst at TerraPower. He is leading the effort to develop a Level-1 PRA for the traveling wave reactor as well as developing the NQA-1 procedures related to the PRA. Additionally, he provides risk information to guide design of safety systems such as the decay heat removal system. Before joining TerraPower, he studied Nuclear Science and Engineering at the Massachusetts Institute of Technology (MIT).

He wrote his thesis on the topic of applying risk information to sodium fast reactor licensing and design. His work was done as part of a multi-university Nuclear Energy Research Initiative study with MIT, The Ohio State University, and Idaho State University entitled "Risk-informed Balancing of Safety, Non-proliferation, and Economics for the Sodium-cooled Fast Reactor (SFR)." He graduated summa cum laude with a B.S. in Nuclear Engineering from Oregon State University.



Zahra Mohaghegh

Soteria Consultants, USA (www.soteriaconsultants.com)

[Presentations given by Zahra Mohaghegh:](#)
[16C-Fr2-4](#)

Dr. Zahra Mohaghegh is the founder and principal research scientist at Soteria Consultants, a startup risk management consulting enterprise which supports proactive decision making for technological systems by collaborating with a cross-disciplinary group of experts from regulatory agencies, academia, national labs, and industry. Her contribution to modeling large-scale complex systems was also recognized by the Zonta International Amelia Earhart Award.

Dr. Mohaghegh earned her M.Sc. and Ph.D. in Reliability Engineering from the University of Maryland (UMD) and worked as a post-doctoral research associate at the Center for Risk and Reliability at UMD. Her Ph.D. and post-doc gave her an opportunity to focus on the incorporation of both social and physical failure mechanisms into Probabilistic Risk Assessment (PRA). She pioneered the integration of Bayesian Belief Networks and System Dynamics with the classical PRA techniques to quantify multidisciplinary risk frameworks.

Zahra is interested in promoting research and education in risk and reliability analysis. Examples include her studies on failure phenomenology and causal modeling, the treatment of dependent failures, Probabilistic Physics-Of-Failure, risk-informed decision making, Human Reliability Analysis, and safety culture & organizational risk factors. Her research has been of interest to regulatory agencies such as the U.S. Federal Aviation Administration (FAA) and the U.S. Nuclear Regulatory Commission (NRC).

Dr. Mohaghegh is the author of the book, *Socio-Technical Risk Analysis*, and over twenty journal and conference papers on risk analysis. She has offered a number of courses in advanced methods of reliability and risk analysis, and taught the first risk management workshop, sponsored by the Nuclear Energy Institute (NEI), at the 2011 U.S. Women in Nuclear conference. Zahra has been on technical committees for international conferences and as a technical reviewer for journals. She is a member of the American Nuclear Society, Society for Risk Analysis, Society of Women Engineers, and American Society of Mechanical Engineers. Dr. Mohaghegh also holds a B.S. in Mechanical Engineering.

Previous PSAM Conferences

- PSAM 1** Beverly Hills, CA, USA, February 1991
General and Technical Program Chair: G. E. Apostolakis
- PSAM 2** San Diego, CA, USA, March 1994
General Chair: M. G. Stamatelatos
Technical Program Chair: G. E. Apostolakis
- PSAM 3** (Held in conjunction with ESREL'96)
Crete, Greece, June 1996
General Chair: I. A. Papazoglou
Technical Chair: P. C. Cacciabue
- PSAM 4** New York, New York, USA, September 1998
General Chair: R. A. Bari
Technical Program Chair: A. Mosleh
- PSAM 5** Osaka, Japan, November 2000
Honorary Chair: H. Uchida
General Chair: S. Kondo
Technical Program Chairs: S. Kondo and K. Furuta
- PSAM 6** San Juan, Puerto Rico, USA, June 2002
General Chair: E. J. Bonano
Technical Program Chair: A. L. Camp
Technical Program C-Chair: A. Ghassemi
- PSAM 7** (held in conjunction with ESREL 2004)
Berlin, Germany, June 2004
General Chair: C. Spitzer
Technical Program Chair: U. Schmocker
Associate General Chair: E. Zio
Technical Program C-Chairs: S. Chakraborty, M. Faber, and S. Hirschberg
- PSAM 8** New Orleans, USA, May 2006
General Co-Chairs: D. Johnson and L. J. Steinberg
Technical Program Co-Chairs: H. Blackman and M. Stamatelatos
- PSAM 9** Hong Kong, China, May 2008
General Chair: V. Ho
Technical Program Chair: Tsu-Mu Kao
Associate Technical Program Chair: E. Zio
- PSAM 10** Seattle, USA, June 2010
General Chair: Bruce Hallbert
Technical Program Chair: Harold S. Blackman

Previous ESREL Conferences

ESREL 2001	European Safety and Reliability Conference Torino, Italy, September 16-20, 2001
ESREL 2002	European Safety and Reliability Conference Lyon, France March 18-21, 2002
ESREL 2003	European Safety and Reliability Conference Maastricht, Netherlands June 15-18, 2003
ESREL 2004 / PSAM 7	European Safety and Reliability Conference and Int. Conf. on Probabilistic Safety Assessment and Management Berlin, Germany June 14-18, 2004
ESREL 2005	European Safety and Reliability Conference Tri City, Poland June 27-30, 2005
ESREL 2006	European Safety and Reliability Conference Estoril, Portugal September 18-22, 2006
ESREL 2007	European Safety and Reliability Conference Stavanger, Norway June 25-27, 2007
ESREL 2008 / 17th SRA-Europe Annual Conference	European Safety and Reliability Conference Valencia, Spain September 22-25, 2008
ESREL 2009	European Safety and Reliability Conference Prague, Czech Republic September 7-10, 2009
ESREL 2010	European Safety and Reliability Conference Rhodes, Greece September 5-9, 2010
ESREL 2011	European Safety and Reliability Conference Troyes, France September 18-22, 2011

General Information

Airport Transportation

Finnair provides regular bus transportation between the Helsinki-Vantaa Airport and the City Terminal near the Railway Station at a cost of approximately 6 €. Taxis between the Airport and the Helsinki city centre cost approximately 40 € (30 minutes). Group taxis are also available at the airport (Yellow Line and Airport Taxi, cost approximately 25 € per person).

Registration and Information Desk

Participants can pick up their personal conference material at the registration desk. The registration desk will be open at Scandic Grand Marina Hotel before the conference as follows:

- Sunday, 24 June 2012 at 17:00–21:00

The registration desk will be open at Marina Congress Center during the conference as follows:

- Monday, 25 June 2012 at 08:00–18:00
- Tuesday, 26 June 2012 at 08:00–18:00
- Wednesday, 27 June 2012 at 08:00–18:00
- Thursday, 28 June 2012 at 08:00–18:00
- Friday, 29 June 2012 at 08:00–16:00

The conference secretariat will be available to assist you during the entire conference at Marina Congress Center.

Language

The conference language is English. There will be no interpretation.

Name Badges

Participants and accompanying persons are obliged to wear the official conference name badges at all conference events. An additional fee will be charged for reproduction of lost name badges.

Photographing, Recording and Mobile Phones

Photographing or recording of oral presentations is not allowed. Mobile phones should be switched off in the lecture halls since they may interfere with the audio system of the halls.

Lunch and Refreshments

Lunch is not included in the participants' registration fee except for Tuesday, however, light lunches can be purchased at Marina Congress Center (15 €). Coffee and tea will be available in the lobby areas during the morning and afternoon coffee breaks. Other lunch options are available e.g. at Scandic Grand Marina Hotel.

Non-Smoking Policy

Smoking will be prohibited in the conference and exhibition areas. Smoking is allowed only outside Marina Congress Center in designated smoking areas.

Cloakroom

Cloakroom is available free of charge next to the entrance on the first (ground) floor of Marina Congress Center.

Conference Assistants

Conference assistants and in-house technical staff are assisting in practical issues in the lecture halls before and during the sessions (e.g. setting up the presentations on the computers and handing microphones for questions).

Internet Connections

Wireless internet connection is available at Marina Congress Center in the lobby areas. User id's and passwords will be available at the registration desk. In addition, two workstations are available close to the registration desk for internet access. Please limit the use to 5 minutes at a time to allow also other participants to use the computers.

Public Transportation

Helsinki has a good public transportation system. Trams operate frequently and the closest tram stop is available just one block away from the Scandic Grand Marina Hotel.

Certificate of Attendance

All participants will receive a certificate of attendance during the conference together with the conference material.

Currency and Credit Cards

The official currency in Finland is euro (€). Most major credit cards are accepted in hotels and shops. VISA, Eurocard and MasterCard are accepted at the conference registration desk.

First Aid

The general emergency phone number is 112. You can call this number free of charge from any phone, including foreign mobile phone connections, without any area code. In genuine emergencies, when someone's life, health or property is in danger, just call 112.

Liability

By registering into the conference and/or by participating in the exhibition joined to the conference, participants agree that neither the organizing committee nor the conference secretariat assume any responsibility for damage or injuries to persons or property during the conference. Participants and exhibitors are advised to organize their own health, travel and personal insurances.

Social Program

The following social events are arranged as part of the conference program:

Welcome Reception

Date: Monday, 25 June 2012
Time: 19:00 – 21:00
Venue: Scandic Marina Congress Center, Exhibition and lobby areas
Address: Katajanokanlaituri 6
Dress code: Informal

Conference Luncheon

Date: Tuesday, 26 June 2012
Time: 11:40 – 13:10
Venue: Scandic Marina Congress Center, Fennia 1 and Fennia 2
Address: Katajanokanlaituri 6
Dress code: Informal

Conference Dinner

Date: Wednesday evening, 27 June 2012
Time: 19:00 – 23:30
Venue: Hilton Helsinki Kalastajatorppa
Address: Kalastajatorpantie 1
Dress code: Smart casual
Bus transportation will be provided at 19:00. Return shuttle buses starting at 22:30.



Helsinki City Reception

Date: Thursday, 28 June 2012
Time: 19:30 – 21:00
Venue: Helsinki City Hall
Address: Pohjoisesplanadi 11-13
Dress code: Smart casual
Short walking distance from the Conference Venue, by Market Square.



Excursion

Visit to Olkiluoto Nuclear Power Plant

Date: Saturday, 30 June 2012
Time: 08:00 – 20:00
Venue: Olkiluoto NPP
Dress code: Informal
Bus transportation will be provided.



Conference Halls and Exhibition Stands

Halls on the first (ground) floor

- Europaea
- Nautica
- Press Room

Halls on the second floor

- Fennia 1
- Fennia 2
- Nordia
- Baltica
- Marine Room

Rooms at Scandic Grand Marina Hotel

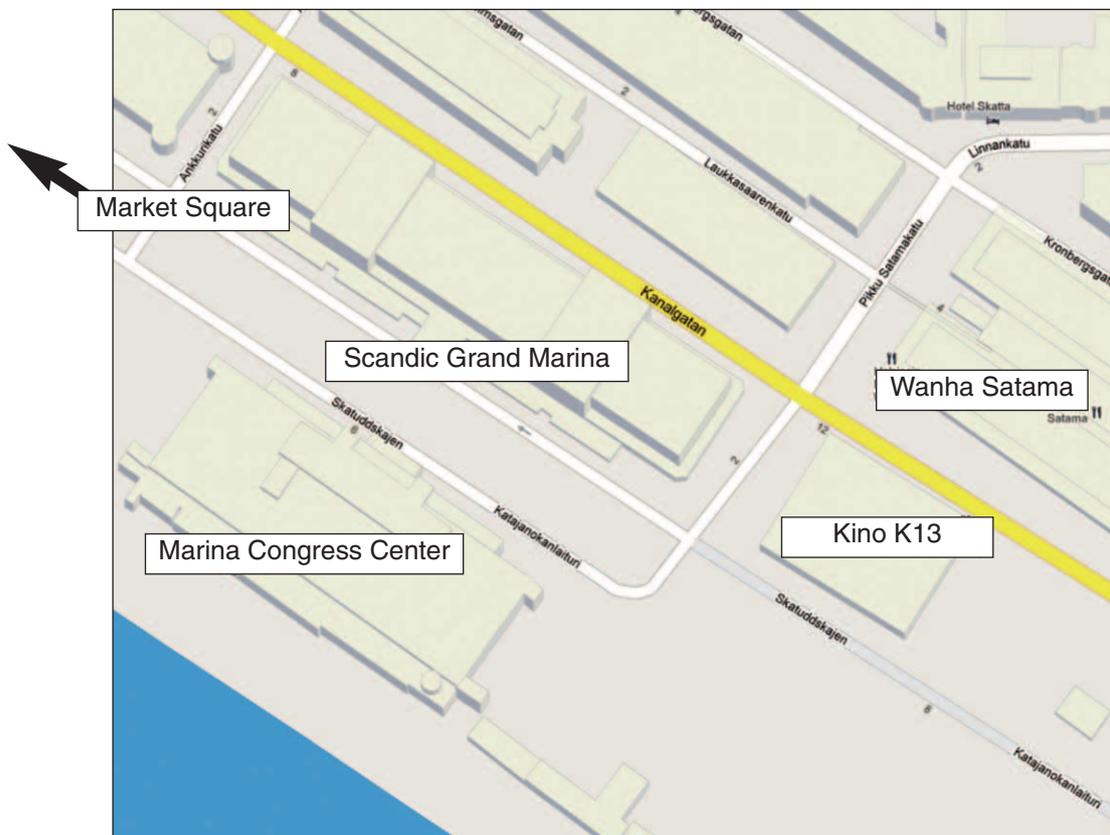
- Eliel First (ground) floor near the hotel reception
- Selim First (ground) floor near the hotel reception

Auditorium at Kino K13

- Kino K13 Auditorium First (ground) floor
(about 100 meters from Marina Congress Center)

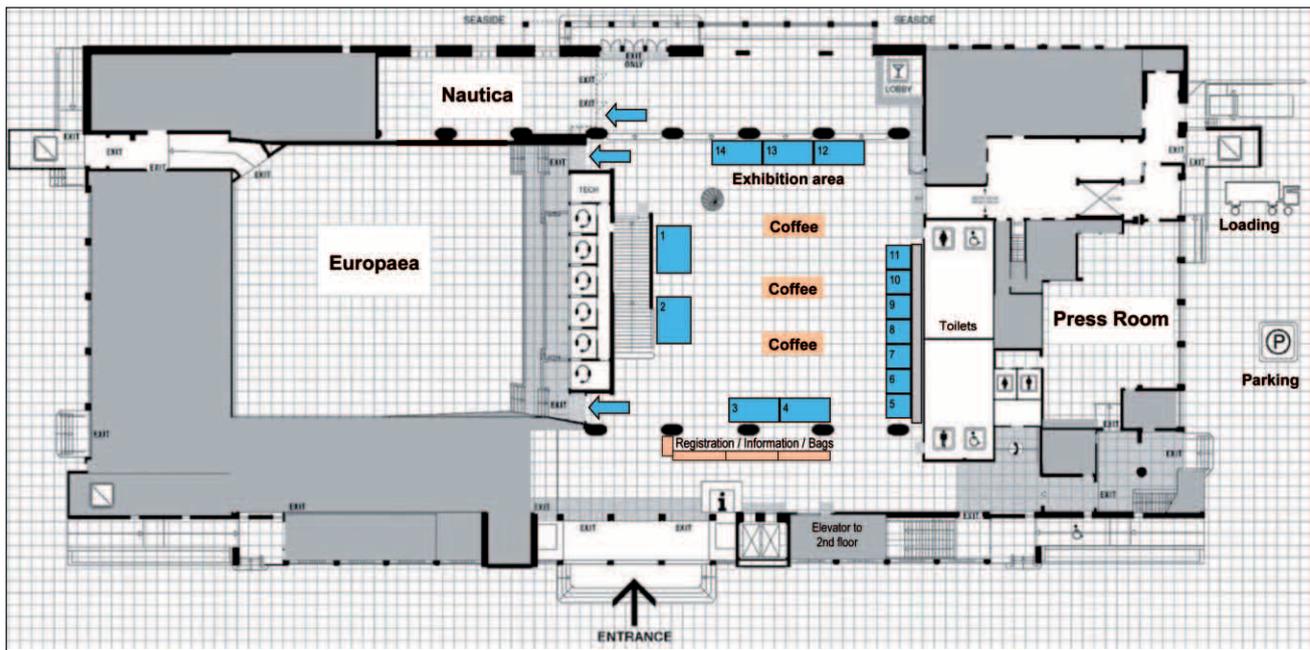
Exhibition stands

- 01 STUK / VTT
- 02 Scandpower
- 03 Fortum
- 04 TVO
- 05 Item Software
- 06 Engineering Planning and Management
- 07 Proactima
- 08 SAGE
- 09 Jacobsen Analytics
- 10 ESRA / IAPSAM
- 11 Safetec Nordic
- 12 Isograph
- 13 DNV
- 14 ReliaSoft Corporation

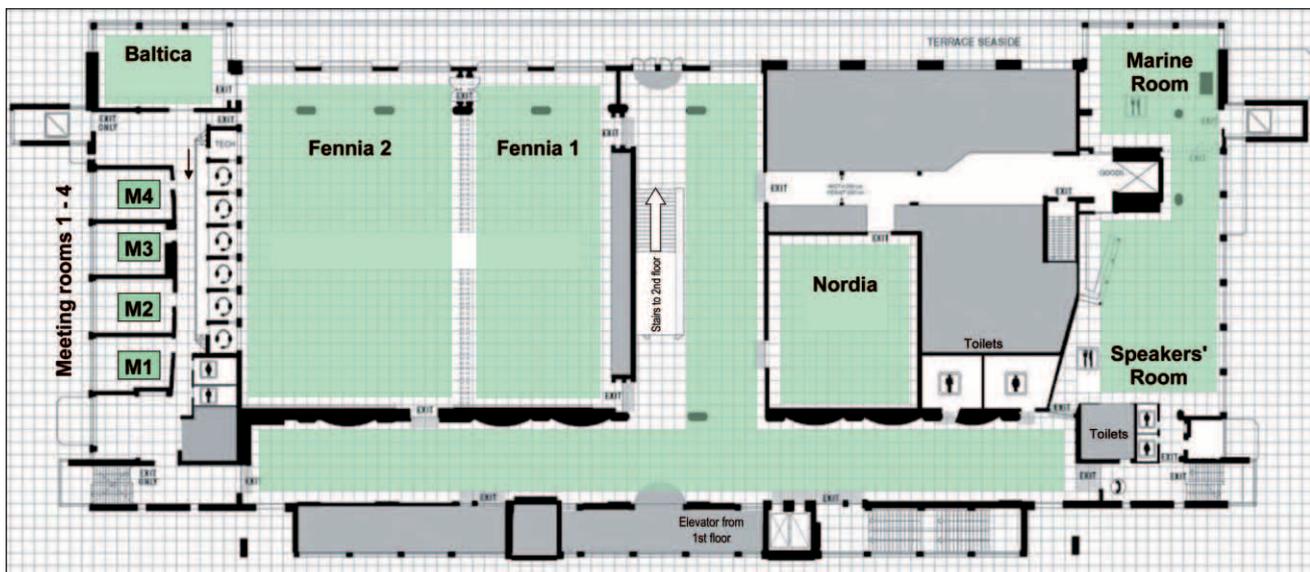


Floor Plans of Marina Congress Center

First (ground) floor



Second floor



Instructions for Chairs and Speakers

Session Chair Instructions

Please be present at your session room at least 15 minutes prior to the start of your session. This will allow you to greet and coordinate media arrangements with the speakers and the room assistant, as well as collect possible biographical sketches (these should be very brief). Alternatively, you can ask each presenter to introduce herself / himself shortly.

A laptop will be provided and set-up in each of the session rooms for the speakers' PowerPoint presentations. You may find it helpful to bring your own laptop and upload the speakers' presentations prior to your session.

For the sake of the meeting attendees, please keep the session synchronized as shown in the final program. You are supposed to signal the presenter when there is 3 minutes remaining in the time slot. Moderate the discussion after each presentation and restrict the discussion if necessary due to the time constraints. Before ending the session, please summarize the session briefly if you find it worthwhile.

Speaker Instructions

PowerPoint or PDF presentations of Monday morning should be delivered preferably already upon registration on Sunday evening at Scandic Grand Marina Hotel. Speaker's room is located on the 2nd floor Restaurant at Marina Congress Center starting on Monday morning. Minor modifications of PowerPoint presentations can also be done in the speaker's room. PowerPoint presentations should be delivered at the latest 3 hours before the starting time of the session or during the day before your presentation.

Only single projection using Microsoft PowerPoint or PDF files will be available in the session rooms. Apple computers, slide projectors or overhead projectors are not available.

Each oral presentation should last not more than 15 minutes following maximum 5 minutes of discussion. The time for the discussion depends on the number of presentation in the session. Speakers are asked to adhere strictly to the 15 minute limit. The chairperson will interrupt the talk if you overrun the time.

Fifteen minutes before the start of their session, all speakers are encouraged to sit in the front row of the session hall close to the speaker podium and to introduce themselves to the session chair and to the hall assistant on duty. This will allow the session chairman to introduce you properly to the audience and the assistant to familiarize you with the audiovisual equipment available in the session hall.

Technical Program Tracks

Number	Abbreviation	Name
01	MAINTENANCE	Maintenance – Modeling and Applications
02	MATHEMATICS	Mathematical Methods in Reliability and Safety
03	UNCERTAINTY	Uncertainty and Sensitivity Analysis
04	OCCUPATIONAL	Occupational Safety
06	DATA	Data Collection and Analysis
07	DSS	Decision Support Systems for Safety and Reliability
08	STOCHASTIC	Stochastic Modeling and Simulation Techniques
09	STRUCTURAL	Structural Reliability
10	SOFTWARE	Software Reliability
11	RISK GENERIC	Risk Assessment – Generic Applications and Methods
12	RISK PERC	Risk Perception and Communication
13	NON-PROB	Non-Probabilistic/Soft Methods in Reliability Analysis
14	ACCIDENT	Accident and Incident Modeling
15	CIVIL FIRE	Civil Engineering – Fire Safety
16	PRA NPP	Probabilistic Risk Assessment – Nuclear
17	RISK MANAG	Risk Management – Risk Informed Assessment
18	SECURITY	Security
19	ECONOMIC	Economic and Finance
20	INDUSTRIAL	Industrial Reliability and Risk Assessment
21	AVIATION	Aviation and Space Safety
22	EXTERNAL	External and Environmental Risks
23	OFFSHORE	Offshore and Marine
24	INFRA	Infrastructures
25	HEALTH	Health Care and Patient Safety
26	SIL	Safety Integrity Level
27	HUMAN ORG	Human and Organizational Factors and Safety Culture
28	TRANSPORT	Transportation
29	EPISTEMIC	Uncertainties in Risk Informed Decision Making
30	IMPORTANCE	Importance Measures
31	CRISIS	Crisis and Accident Management
XX	S	Special Sessions

01 - MAINTENANCE:	Maintenance - Modeling and Applications
01-Mo2	Advances in maintenance modeling 1
01S-Mo3	Maintenance of transportation systems
01S-Mo4	Covariate-driven maintenance
01S-Mo5	Asset management and maintenance
01-Tu2	Condition based maintenance
01-Tu3	Maintenance modeling and optimization of complex systems
01-Tu4	Reliability centred maintenance
01-Tu5	Preventive maintenance
01-We2	Overview, discussions and new approaches
01-We3	Modeling tools and software for maintenance analyses
01-We4	Predictive maintenance
01S-Th2	System health monitoring, fault diagnosis and prognosis
01-Th5	Advances in maintenance modeling 2
02 - MATHEMATICS:	Mathematical Methods in Reliability and Safety
02-Mo2	Analysis of networked systems
02-Tu5	Bayesian analysis and simulation
02-We2	Dynamic analysis
02S-We3	Bayesian network applications 1
02AS-We4	Bayesian network applications 2
02B-We4	Reliability analysis
02-Th2	Markovian models
02-Th3	Stochastic modeling in reliability
02-Th4	Risk analysis
02-Th5	Probabilistic and statistical modeling and analysis
02A-Fr2	Statistical failure analysis
02BS-Fr2	HRA and Bayesian analysis
02-Fr3	Tools for RAMS assessment
03 - UNCERTAINTY:	Uncertainty and Sensitivity Analysis
03-Mo2	Sensitivity analysis
03-Mo3	Uncertainty analysis 1
03S-Tu2	Uncertainty analysis 2
03-Tu4	Uncertainty and sensitivity
04 - OCCUPATIONAL:	Occupational Safety
04-Mo5	Occupational risk modeling
04-Tu2	Occupational risk
04-Tu3	Occupational risk assessment
06 - DATA:	Data Collection and Analysis
06-Mo5	Statistical data analysis (non-nuclear)
06-Tu5	Data collection and analysis (non-nuclear)
07 - DSS:	Decision Support Systems for Safety and Reliability
07-We2	DSS case studies
08 - STOCHASTIC:	Stochastic Modeling and Simulation Techniques
08-Mo2	Stochastic modeling – case studies
08-Mo3	Fire risk modeling and simulation
08-We2	Stochastic simulation for reliability and risk analysis
09 - STRUCTURAL:	Structural Reliability
09-Mo2 >>> 09-Tu5	Reliability and concrete structures
09-Mo3	Structural reliability and degradation modeling 1
09-Mo4	Structural reliability and degradation modeling 2
09-We3	Structural reliability and degradation modeling 3

10 - SOFTWARE:	Software Reliability
10-We3	I&C reliability models 1
10-Th2	Software reliability assessment 1
10-Th3	Software reliability assessment 2
10-Th4	Failure modes identification and classification
10-Th5	I&C reliability models 2
10S-Fr2	Safety systems for real time applications 1
10S-Fr3	Safety systems for real time applications 2
11 - RISK GENERIC:	Risk Assessment – Generic Methods and Applications
11-Mo4	Risk assessment 1
11-Tu2	Risk management 1
11-Tu3	Risk management 2
11-Tu4	Nuclear spent fuel safety
11-Tu5	Risk assessment 2
12 - RISK PERC:	Risk Perception and Communication
12-Tu3	Risk and reliability criteria
12-We4	Risk perception and communication
12-Th3	Risk assessment – fundamental issues
13 - NON-PROB:	Non-Probabilistic/Soft Methods in Reliability Analysis
13-Th2	Expert judgments
13-Fr2	Non-probabilistic analyses
14 - ACCIDENT:	Accident and Incident Modeling
14-Mo4	Risk assessment – consequence analysis
15 - CIVIL FIRE:	Civil Engineering – Fire Safety
15-Mo2	Fire safety
16 - PRA NPP:	Probabilistic Risk Assessment – Nuclear
16AS-Mo2	Deterministic-probabilistic safety assessment
16BS-Mo2	Passive systems – design
16A-Mo3	Modeling and data analysis
16BS-Mo3	NRC HRA data
16A-Mo4	PRA development – overview
16BS-Mo4	Passive systems – innovative reactor concepts
16C-Mo4	Codes and tools 1
16A-Mo5	Dynamic PRA
16BS-Mo5	Passive systems - advanced reactors
16C-Mo5	Codes and tools 2
16S-Tu2	Fukushima accident 1
16-Tu3	Fukushima – panel discussion
16A-Tu4	Data analysis
16B-Tu4	HRA based on empirical study
16C-Tu4	PRA Level 2 and 3
16A-Tu5	RI applications
16B-Tu5	New HRA methods 1
16C-Tu5	PRA Level 2 related applications
16AS-We2	Fukushima accident 2
16BS-We2	Very long term storage of radioactive waste 1
16A-We3	New HRA methods 2
16BS-We3	Very long term storage of radioactive waste 2
16A-We4	Shutdown and spent fuel analyses
16B-We4	Advances in fault tree and event tree methods
16AS-Th2	Fukushima accident 3
16B-Th2	Fire methods and applications 1
16A-Th3	Risk monitors

16B-Th3	Comparison of HRA methods
16C-Th3	Other reactor types
16D-Th3	Fire methods and applications 2
16A-Th4	RI maintenance, testing and technical specifications
16B-Th4	HRA applications 1
16C-Th4	Fire methods and applications 3
16A-Th5	PRA case studies
16B-Th5	HRA applications 2
16C-Th5	Data collection and analysis for fire PRA
16AS-Fr2	Fukushima and stress tests
16B-Fr2	HRA applications 3
16C-Fr2	CCF and dependences
16A-Fr3	Modeling power systems
16B-Fr3	HRA – panel discussion: Errors of commission – Where do we stand?
16C-Fr3	NPP reliability data

17 - RISK MANAG:

17-Mo2	Risk Management – Risk Informed Assessment
17-Mo3	RI decision making in nuclear domain – applications
17-Mo4	NPP ageing issues
17-Mo5	Methodological approaches to support risk management
17-Tu2	Regulatory insights and experiences on RI approaches
17-Tu3	RI inspections
17-Tu4	PRA in risk management
17S-We2	Safety assessment, management and goals
17-Fr2	Severe accident management guidance
	RI approaches for regulatory oversight

18 - SECURITY:

18-Tu2	Security
18-Tu3	Security methods and applications
	Security methods

19 - ECONOMIC:

19-Th3	Economic and Finance
	Economic and financial issues

20 - INDUSTRIAL:

20-Mo3	Industrial Reliability and Risk Assessment
20-Mo5	Safety management and safety performance
20-Tu2	Industrial analysis approaches and cases 1
20-Tu4	Reliability analysis
20-Tu5	Automotive systems
20-We2	Risk management
20-We3	Fires and explosions
20-Th2	RAMS 1
20-Th3	Learning from incidents
20-Th4	Risk assessment applications 1
20-Th5	Risk assessment applications 2
20-Fr2	Industrial analysis approaches and cases 2
20-Fr3	RAMS 2
	Risk assessment applications 3

21 - AVIATION:

21S-Tu4	Aviation and Space Safety
21-We3	Managing system changes in aviation – novel issues for PRA
21-We4	Critical issues in aviation – safety performance 1
21-Th2	Aviation safety management
21-Th4	Aerospace safety management
	Critical issues in aviation – safety performance 2

22 - EXTERNAL:

22-We2	External and Environmental Risks
22-We3	External hazards 1
	Seismic risk – applications

22-We4	Seismic risk – methodology
22-Th2	External hazards 2
22-Th5	Environmental impact assessments
22-Fr2	Environmental impact and climate change
22-Fr3	Flooding risks
23 - OFFSHORE:	Offshore and Marine
23S-Mo3	Risk analysis methodologies in marine safety
23-Tu2	Oil and gas risk assessment
23-Tu3	Drilling risk assessment
23-Tu4	Marine operations risks
23-Tu5	Marine transportation risk assessment
23-We2	Offshore risk management
24 - INFRA:	Infrastructures
24-Mo2	Critical infrastructures 1
24-Mo3	Critical infrastructures 2
24-Mo4	Water systems
24S-We4	Vulnerability of critical infrastructures 1
24S-Th5 >>> 24S-We5	Vulnerability of critical infrastructures 2
25 - HEALTH:	Health Care and Patient Safety
25-Th4	Health care 1
25-Fr3	Health care 2
26 - SIL:	Safety Integrity Level
26-Tu5	SIL decision support
26-We3	SIL specific issues
26-Fr2	SIL high-level considerations
27 - HUMAN ORG:	Human and Organizational Factors and Safety Culture
27-Mo2	Cognition, context and HRA
27-Mo3	Human factors engineering
27-Mo4	Key issues in HRA development
27-Mo5	HRA in team and organization level
27-Tu4	Organizational learning and modeling
27-We2	Risk and safety behaviour
27-We3	Safety culture in complex systems
27-We4	Safety culture and indicators
27-Th2	Organizational factors and safety
27-Th3	Safety culture
27-Th4	Key issues in safety management
28 - TRANSPORT:	Transportation
28-We4	Railway safety
28-Th5	Modeling and applications – transportation
28-Fr3	Railway safety and reliability modeling
29 - EPISTEMIC:	Epistemic Uncertainty – Risk Informed Decision Making
29-Mo4	Dana Kelly memorial: Epistemic uncertainties 1
29-Mo5	Epistemic uncertainties 2
29-Tu3	Model uncertainties and validation
30 - IMPORTANCE:	Importance Measures
30-Th4	Importance measures
31 - CRISIS:	Crisis Management
31-Th5	Vulnerability and resilience analysis

Program Outline – Monday, 25 June 2012

Europaea	Fennia 2	Fennia 1	Nordia	Nautica	Press room
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09:00-10:30
Opening and plenary
Mo1

Opening
PL-Mo1
Plenary

10:30-11:00

COFFEE BREAK

11:00-12:20
Parallel sessions
Mo2

PRA NPP	PRA NPP	HUMAN ORG	UNCERTAINTY	MAINTENANCE	MATHEMATICS
16AS-Mo2	16BS-Mo2	27-Mo2	03-Mo2	01-Mo2	02-Mo2
Deterministic-probabilistic safety assessment	Passive systems - design	Cognition, context and HRA	Sensitivity analysis	Advances in maintenance modeling 1	Analysis of networked systems

12:20-13:50

LUNCH BREAK

13:50-15:10
Parallel sessions
Mo3

PRA NPP	PRA NPP	HUMAN ORG	UNCERTAINTY	MAINTENANCE	INDUSTRIAL
16A-Mo3	16BS-Mo3	27-Mo3	03-Mo3	01S-Mo3	20-Mo3
Modeling and data analysis	NRC HRA data	Human factors engineering	Uncertainty analysis 1	Maintenance of transportation systems	Safety management and safety performance

15:10-15:40

COFFEE BREAK

15:40-17:00
Parallel sessions
Mo4

PRA NPP	PRA NPP	HUMAN ORG	EPISTEMIC	MAINTENANCE	RISK GENERIC
16A-Mo4	16BS-Mo4	27-Mo4	29-Mo4	01S-Mo4	11-Mo4
PRA development - overview	Passive systems - innovative reactor concepts	Key issues in HRA development	Dana Kelly memorial: Epistemic uncertainties 1	Covariate-driven maintenance	Risk assessment 1

17:00-17:30

FRUIT BREAK

17:30-18:30
Parallel sessions
Mo5

PRA NPP	PRA NPP	HUMAN ORG	EPISTEMIC	MAINTENANCE	INDUSTRIAL
16A-Mo5	16BS-Mo5	27-Mo5	29-Mo5	01S-Mo5	20-Mo5
Dynamic PRA	Passive systems - advanced reactors	HRA in team and organization level	Epistemic uncertainties 2	Asset management and maintenance	Industrial analysis approaches and cases 1

19:00-21:00

Welcome Reception at Marina Congress Center

Baltica	Marine room	ElieI (hotel)	Selim (hotel)	Kino K13
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Session moved to

09-Tu5



COFFEE BREAK

INFRA	RISK MANAG	STRUCTURAL	STOCHASTIC	CIVIL FIRE
24-Mo2	17-Mo2	09-Mo2	08-Mo2	15-Mo2
Critical infrastructures 1	RI decision making in nuclear domain - applications	Reliability and concrete structures	Stochastic modeling - case studies	Fire safety

LUNCH BREAK

INFRA	RISK MANAG	STRUCTURAL	STOCHASTIC	OFFSHORE
24-Mo3	17-Mo3	09-Mo3	08-Mo3	23S-Mo3
Critical infrastructures 2	NPP - ageing issues	Structural reliability and degradation modeling 1	Fire risk modeling and simulation	Risk analysis methodologies in marine safety

COFFEE BREAK

INFRA	RISK MANAG	STRUCTURAL	ACCIDENT	PRA NPP
24-Mo4	17-Mo4	09-Mo4	14-Mo4	16C-Mo4
Water systems	Methodological approaches to support risk management	Structural reliability and degradation modeling 2	Risk assessment - consequence analysis	Codes and tools 1

FRUIT BREAK

DATA	RISK MANAG	OCCUPATIONAL
06-Mo5	17-Mo5	04-Mo5
Statistical data analysis (non-nuclear)	Regulatory insights and experiences on RI approaches	Occupational risk modeling

PRA NPP
16C-Mo5
Codes and tools 2

09:00-10:30
Opening and plenary
Mo1

10:30-11:00
11:00-12:20
Parallel sessions
Mo2

12:20-13:50
13:50-15:10
Parallel sessions
Mo3

15:10-15:40
15:40-17:00
Parallel sessions
Mo4

17:00-17:30
17:30-18:30
Parallel sessions
Mo5

19:00

Opening	Opening session	
Europa		
09:00 – 10:00	Chair: Reino Virolainen (FINLAND)	Opening

Opening Remarks

Director general STUK, Prof. Tero Varjoranta (FINLAND)

Introduction of Technical Program

Program Chair, Prof. Terje Aven (NORWAY)

Introduction of IAPSAM

President IAPSAM, Dr. Bruce Hallbert (USA)

Introduction of ESRA

Chairman ESRA, Prof. Enrico Zio (ITALY)

Honorary Chair's Remarks

Commissioner USNRC, George Apostolakis (USA)

Practical Information

General Chair, Reino Virolainen (FINLAND)



Prof. Enrico Zio (BS in nuclear engng., Politecnico di Milano, 1991; MSc in mechanical engng., UCLA, 1995; PhD, in nuclear engng., Politecnico di Milano, 1995; PhD, in nuclear engng., MIT, 1998) is Director of the Chair in Complex Systems and the Energetic Challenge of the European Foundation for New Energy of Electricite' de France (EDF) at Ecole Centrale Paris and Supelec, 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 Chairman of the European Safety and Reliability Association ESRA, member of the scientific committee of the Accidental Risks Department of the French National Institute for Industrial Environment and Risks, member of the Korean Nuclear society and China Prognostics and Health Management society, and past-Chairman of the Italian Chapter of the IEEE Reliability Society. He is serving as Associate Editor of IEEE Transactions on Reliability and as editorial board member in various international scientific journals, among which Reliability Engineering and System Safety, Journal of Risk and Reliability, International Journal of Performability Engineering, Environment, Systems and Engineering, International Journal of Computational Intelligence Systems. He has functioned as Scientific Chairman of three International Conferences and as Associate General Chairman of two others. His research focuses on the characterization and modeling of the failure/repair/maintenance behavior of components, complex systems and critical infrastructures for the study of their reliability, availability, maintainability, prognostics, safety, vulnerability and security, mostly using a computational approach based on advanced Monte Carlo simulation methods, soft computing techniques and optimization heuristics. He is author or co-author of five international books and more than 170 papers on international journals.

The uncertainty of risk, the risk of uncertainty

We can all agree that risk assessment is useful to inform decisions. We can all agree that our risk assessment models are based on our (incomplete) knowledge on the phenomena involved and that, thus, uncertainty analysis plays an important role for the confidence in the decisions. And we all know that the probabilistic framework is the one routinely adopted.

We also are all aware that accidents with catastrophic consequences can occur, and our main job is to render these events even more unlikely than they already are. These situations are located in the south-east corner of the likelihood/consequence plane, where our knowledge that goes into the model is very limited, probabilities must be interpreted as subjective and most "nightmares" arise (including "perfect storms" and "black swans"). Is the probabilistic risk assessment framework the most appropriate one in these cases? Does the information available to characterise these situations provide a sufficiently strong basis for the specific (subjective) probability assignments, which we end up using for informing decisions, in spite of the theoretical help of the beautiful Bayesian updating framework?

In this lecture, I will try to share the above concerns and position them within some of the frameworks which have been developed as alternatives to the probabilistic one, such as probability bound analysis, imprecise probability, random sets, possibility theory. My intention is to take a critical, open engineering viewpoint (I promise not to get into the technical details of the different frameworks). The end point of the critical reflection will be really the decision making and the need to feed it with the information available, completed with the justified introduction of subjective knowledge through a process of faithful representation of information and introduction of knowledge.

16AS-Mo2	Deterministic-probabilistic safety assessment	
Europaea		
11:00 – 12:20	Chair: Pavel Kudinov (SWEDEN)	PRA NPP
Development and Application of a Dynamic Level 1 and 2 Probabilistic Safety Assessment Tool Mosleh, A. (UNITED STATES)		16AS-Mo2-1
Nuclear Power Plant Precursor Risk Assessment Using a Dynamic Probabilistic Risk Method Coyne, Kevin (UNITED STATES)		16AS-Mo2-2
Combining PSA and DSA methods for reactor cold overpressure effect analysis Poghosyan, Shahen (ARMENIA)		16AS-Mo2-3
The impact of dynamics on the MLOCA accident model – an application of dynamic event trees Karanki, Durga Rao (SWITZERLAND)		16AS-Mo2-4
Development of the DPSA Methodology Based on Genetic Algorithm for Identification of Failure Domains in Nuclear Power Plant Accident Scenarios Space Vorobyev, Yury (RUSSIAN FEDERATION)		16AS-Mo2-5

16BS-Mo2	Passive systems – design	
Fennia 2		
11:00 – 12:20	Chair: Francesco Di Maio (ITALY)	PRA NPP
Passive Safety Systems for Spent Fuel Pool Severe Accidents Duan, Chengjie (CHINA)		16BS-Mo2-1
Passive Safety Systems in Advanced Water Cooled Reactors Choi, Jong-Ho (AUSTRIA)		16BS-Mo2-2
Incorporate Modelling Uncertainty into the Decision Making of Passive System Reliability Assessment Wang, Tairan (CHINA)		16BS-Mo2-3
Fault tree and Monte Carlo simulation in passive system reliability analysis Yu, Yu (CHINA) >>> Moved to session 02-Th3		16BS-Mo2-4

27-Mo2	Cognition, context and HRA	
Fennia 1		
11:00 – 12:20	Chair: Luca Podofillini (SWITZERLAND)	Human Org
A New Method for Human Reliability Assessment in Railway Transport Schwencke, Daniel (GERMANY)		27-Mo2-1
Task Complexity Measure for Emergency Operating Procedures Based on Resource Requirements in Human Information Processing Liu, Peng (CHINA)		27-Mo2-2
A distributed cognition-based cognitive analysis tool for knowledge management Inoue, Satoru (JAPAN)		27-Mo2-3
A tool-supported training framework for improving operators' dependability confronted with faults and errors Barboni, Eric (FRANCE) >>> Moved to session 27-We2		27-Mo2-4
SHERPA, A Systematic, Human Error Reduction and Prediction Approach to modelling and assessing human reliability in complex tasks Embrey, David (UNITED KINGDOM)		27-Mo2-5

12:20 – 13:50	Lunch break
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03-Mo2	Sensitivity analysis	
Nordia		
11:00 – 12:20	Chair: Matthias Troffaes (UNITED KINGDOM)	Uncertainty

Some new insights in derivative-based global sensitivity measures Popelin, Anne-Laure (FRANCE)	03-Mo2-1
Estimating Global Sensitivity Statistics from Given Data Plischke, Elmar (GERMANY)	03-Mo2-2
A Metamodel Approach to Sensitivity Analysis of a PA Model for a Generic HLW Repository in Clay Spiessl, Sabine M. (GERMANY)	03-Mo2-3
Particularities in sensitivity analysis of numerical models for long-term safety of final repositories Becker, Dirk-Alexander (GERMANY)	03-Mo2-4
Sensitivity analysis of safety factor predictions for nuclear component behaviour under accidental conditions Marrel, Amandine (FRANCE)	03-Mo2-5

01-Mo2	Advances in maintenance modeling 1	
Nautica		
11:00 – 12:20	Chair:	Maintenance

A state based model for opportunity based maintenance Vatn, Jørn (NORWAY)	01-Mo2-1
Analysis of Block-Inspection Policy parameters from economical and availability point of view Werbinska-Wojciechowska, Sylwia (POLAND)	01-Mo2-2
A Comparison of Asymptotic and Finite Time Solutions for the Discounted Maintenance Cost of Repairable Systems Pandey, Mahesh (CANADA)	01-Mo2-3
Investigating deferment of maintenance actions Ansell, Jake (UNITED KINGDOM)	01-Mo2-4

02-Mo2	Analysis of networked systems	
Press Room		
11:00 – 12:20	Chair: Christian Tanguy (FRANCE)	Mathematics

Semi-Markov models for performance evaluation of telecommunication networks in the presence of failures Postiglione, Fabio (ITALY)	02-Mo2-2
Modeling key performance indicators for the availability and quality of experience of voice over IP services Tanguy, Christian (FRANCE)	02-Mo2-3
Influence of bus partitioning on the reliability of transmissions Aza-Vallina, Damien (FRANCE)	02-Mo2-4
A Petri net-based approach for computing two-terminal reliability of a transportation network with multi-state nodes and arcs Zhang, Tao (CHINA) >>> Moved from session 28-Th5	28-Th5-1

24-Mo2	Critical infrastructures 1	
Baltica		
11:00 – 12:20	Chair: Seth Guikema (UNITED STATES)	Infra
The Effects of Hurricane Surge in Power System Outage Risk Models Guikema, Seth (UNITED STATES)		24-Mo2-1
Some aspects of the risk evaluations for renewable energy systems Serbanescu, Dan (ROMANIA)		24-Mo2-2
Susceptibility and vulnerability of urban buildings and infrastructure against terroristic threat from qualitative and quantitative risk analysis Häring, Ivo (GERMANY)		24-Mo2-3
Network Analysis of a Real Power Transmission System Zio, Enrico (ITALY)		24-Mo2-4
The VNK2-project: Quantifying flood risks in the Netherlands Jongejan, Ruben (NETHERLANDS) >>> Moved from session 22-Fr3		22-Fr3-1

17-Mo2	RI decision making in nuclear domain – applications	
Marine Room		
11:00 – 12:20	Chair: Cornelia Spitzer (GERMANY)	Risk manag
Evaluation of Risk Within the Framework of Preparing a Risk-Informed Decision for NPP and the Level of Decision Influence on Defence-In-Depth Lankin, Mikhail (RUSSIAN FEDERATION)		17-Mo2-1
Assessment of the Adequacy of Existing Risk-Informed Regulatory Guidance for New Reactors Powell, Eric (UNITED STATES)		17-Mo2-2
Pilot project to enhance operational safety of the Paks NPP based on risk-informed decision making Kiss, Tibor (HUNGARY)		17-Mo2-3
ASME/ANS Technology Neutral PRA Standard for Advanced Non-LWRs Fleming, Karl (UNITED STATES)		17-Mo2-4
An Integrated Risk Informed Decision Making Approach for Germany Wielenberg, Andreas (GERMANY)		17-Mo2-5

12:20 – 13:50 Lunch break

09-Mo2	Reliability and concrete structures	
Eliei (hotel)	This session has been moved to Tuesday: 09-Tu5 (Hall Fennia 1)	
11:00 – 12:20	Chair: Jana Markova (CZECH REPUBLIC)	Structural
Evaluation of reliability of existing intermediate floor beams of reinforced concrete Derry, Markus (FINLAND)		09-Mo2-1
Probabilistic analysis of structures in serviceability conditions Markova, Jana (CZECH REPUBLIC)		09-Mo2-2
Influence of a new CUSUM based conformity inspection scheme for EN 206-1 on the safety level of concrete structures Van Coile, Ruben (BELGIUM)		09-Mo2-3
Verification of Existing Reinforced Concrete Bridges using the Design Value Method Markova, Jana (CZECH REPUBLIC)		09-Mo2-4

08-Mo2	Stochastic modeling – case studies	
Selim (hotel)		
11:00 – 12:20	Chair: David Valis (CZECH REPUBLIC)	Stochastic
A New Ensemble Model for Short Term Wind Power Prediction Albu, Razvan-Daniel (ROMANIA)		08-Mo2-1
Modeling of transport of radioactive substances from underground storage with uncertainties of geologic parameters Chudoba, Josef (CZECH REPUBLIC)		08-Mo2-2
The Impact of Initial Operation Deterioration on Sequential System Reliability Valis, David (CZECH REPUBLIC)		08-Mo2-4
Assessment of statistical long-term wave power availability Leira, Bernt (NORWAY)		08-Mo2-5

15-Mo2	Fire safety	
Kino K13		
11:00 – 12:20	Chair: Kurt Petersen (DENMARK)	Civil Fire
Structural protection with water mist fire fighting systems Lior, Amit (FINLAND)		15-Mo2-1
Fire Hazards Hindering Safe Evacuation during Fires in Road Tunnels Hugosson, Jonatan (SWEDEN)		15-Mo2-2
Does passive house mean higher fire hazard? Fourneau, Charles (BELGIUM)		15-Mo2-3
Interpretation of Safety Margin in ASET/RSET Assessments in the Norwegian Building Industry Njå, Ove (NORWAY)		15-Mo2-4
Evaluation of the possibility to use waterscreen for improving people evacuation from the Gran Sasso National Laboratory inside the highway tunnel. Basti, Andrea (ITALY)		15-Mo2-5

16A-Mo3	Modeling and data analysis	
Europaea		
13:50 – 15:10	Chair: Vidar H. Swaling (NORWAY)	PRA NPP
A study of the influence of updating initiating event frequencies for the Japanese NPPs Ota, Takayuki (JAPAN)		16A-Mo3-1
Age-dependent hierarchical Bayesian modelling for long-term reliability assessment lesmantas, Tomas (LITHUANIA)		16A-Mo3-2
Prioritizing Component Failures in Fault Tree Analysis Using Interval-valued Probability Estimates Toppila, Antti (FINLAND)		16A-Mo3-3
Markov Model of Severe Accident Progression and Management Bari, Robert (UNITED STATES)		16A-Mo3-4

16BS-Mo3	NRC HRA data	
Fennia 2		
13:50 – 15:10	Chair: James Chang (UNITED STATES)	PRA NPP
Human Performance/Error Data Collection for Incident Analysis Via Timeline Generation Method and Tool: A Case Study Bley, Dennis C. (UNITED STATES)		16BS-Mo3-1
Model-based Framework for Characterizing Crew Performance and Contextual Factors for HRA Applications Mosleh, Ali (UNITED STATES)		16BS-Mo3-2
Overview of the NRC's HRA Data Program and Recent Activities Chang, Yung Hsien James (UNITED STATES)		16BS-Mo3-3
Methodology for Collection and Analysis of Simulator Data for HRA Applications Kirwan, Barry (UNITED STATES)		16BS-Mo3-4
Overview of Licensed Operator Simulator Training Data and Use for HRA Chang, James (UNITED STATES)		16BS-Mo3-5

27-Mo3	Human factors engineering	
Fennia 1		
13:50 – 15:10	Chair:	Human org
How does time availability influence the execution of computerized emergency operating procedures Dong, Xiaolu (CHINA)		27-Mo3-1
Development of a Simulated Main Control Room (MCR) Information Display System for AP1000 Nuclear Power Plant Yuan, Xihui (CHINA)		27-Mo3-2
Evaluating FBTA-Based User Interface Design for digital Nuclear Power Plants Wu, Xiaojun (CHINA)		27-Mo3-3
The impact of digit human-system interfaces upon operator cognition in a nuclear power plant control room Dai, Licao (CHINA)		27-Mo3-4
Economic benefits of human factors methods deployment Doležal, Radim (CZECH REPUBLIC)		27-Mo3-5

15:10 – 15:40	Coffee break
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03-Mo3	Uncertainty analysis 1	
Nordia		
13:50 – 15:10	Chair: Ali Mosleh (USA)	Uncertainty
Quantifying data uncertainty due to sparse and/or interval data Mahadevan, Sankaran (UNITED STATES)		03-Mo3-1
Probabilistic modelling of variables with inequality constraints Dutfoy, Anne (FRANCE)		03-Mo3-2
The Impact of Uncertainty Type and Representation in Performance Assessment Esh, David (UNITED STATES)		03-Mo3-3
The Effects of Considering SOKC for Uncertainty Analyses and PSA Model Developing Strategy Muta, Hitoshi (JAPAN)		03-Mo3-4
The treatment of uncertainty in national risk assessment methodologies Veland, Henning (NORWAY)		03-Mo3-5

01S-Mo3	Maintenance of transportation systems	
Nautica		
13:50 – 15:10	Chair: Jørn Vatn (NORWAY)	Maintenance
Bayesian updating for road maintenance optimization Castanier, Bruno (FRANCE)		01S-Mo3-1
A Railway Track Ballast Maintenance and Inspection Model for Multiple Track Sections Prescott, Darren (UNITED KINGDOM)		01S-Mo3-2
Study on maintainability measures of passenger transport system Werbinska-Wojciechowska, Sylwia (POLAND)		01S-Mo3-3
A study of the efficacy of the inspection of railway rolling stock Cavalcante, Cristiano (UNITED KINGDOM) >>> Moved from session 01-We2		01-We2-5

20-Mo3	Safety management and safety performance	
Press Room		
13:50 – 15:10	Chair: Veikko Rouhiainen (FINLAND)	Industrial
Structural safety performance of Dutch and Spanish engineering companies Terwel, Karel C. (NETHERLANDS)		20-Mo3-1
Application of HRA to Accident Risk Assessment in Urban Intersections Furuta, Kazuo (JAPAN)		20-Mo3-2
A Behavior-Based Monitoring System for Safety Management Nascimento, Cesar (BRAZIL)		20-Mo3-3
Improving the prediction of human reliability in manual assembly Günnel, Benjamin (GERMANY)		20-Mo3-4
Systems-theoretic analysis of interdisciplinary control loops within the traffic system taking into account a behavioral human-machine-interface Hosse, René (GERMANY)		20-Mo3-5

24-Mo3	Critical infrastructures 2	
Baltica		
13:50 – 15:10	Chair: Jose Ramirez-Marques (UNITED STATES)	Infra
	Network Protection Against Diverse Attacks - A Multi-objective Perspective Ramirez-Marquez, Jose Emmanuel (UNITED STATES)	24-Mo3-1
	Computer simulation for risk management: Hydrogen refueling stations and water supply of a large region Markert, Frank (DENMARK)	24-Mo3-2
	Analysis and Comparison of Risk and Load Point Indices of Power System Model HLI and HLII Rana, Lalit Bickram (FINLAND)	24-Mo3-3
	Interdependencies and economic assessment of critical infrastructures in the EU: A combined system engineering and economic model Dorneanu, Bogdan (ITALY)	24-Mo3-4

17-Mo3	NPP – ageing issues	
Marine Room		
13:50 – 15:10	Chair: Geza Macsuga (HUNGARY)	Risk manag
	Role of Level 1 PSA at IRSN for plants life extension Lanore, Jeanne-Marie (FRANCE)	17-Mo3-1
	Risk-informed decision making using ageing PSA model Poghosyan, Shahen (ARMENIA)	17-Mo3-2
	Incorporation of reliability attributes into the maintenance rule for the qualified life extension of nuclear power plant safety Saldanha, Pedro (BRAZIL)	17-Mo3-3
	Operational Experience Assessment on NPP Ageing Related Reportable Events Rodionov, Andrei (FRANCE)	17-Mo3-4

09-Mo3	Structural reliability and degradation modeling 1	
Eliei (hotel)		
13:50 – 15:10	Chair:	Structural
Modelling dependence using copulas – an implementation illustration in the field of structural reliability Remy, Emmanuel (FRANCE)		09-Mo3-1
Compliance sampling inspection for Localized deterioration process van der Weide, Johannes A.M. (NETHERLANDS)		09-Mo3-2
Reliability of a system from the one of its components and the REX using a strength-stress method linked with a Bayesian net de Reffye, Jerome (FRANCE)		09-Mo3-3
Scaling Structural Loads for the Structure Seismic Fragility Lee, Dong-Won (KOREA (REP.))		09-Mo3-4

08-Mo3	Fire risk modeling and simulation	
Selim (hotel)		
13:50 – 15:10	Chair: Marina Röwekamp (GERMANY)	Stochastic
Simulation of fire behaviour and human operations using a new stochastic operation time model Kling, Terhi (FINLAND)		08-Mo3-1
Fire Modeling of an Emerging Fire Suppression System Cournoyer, Michael (UNITED STATES)		08-Mo3-2
Coal Fires – Definition of thermal load on the metallic structures of Coal Conveyor Belts and Coal Covered Storage by means of Fire Dynamics Simulator Benucci, Stefania (ITALY)		08-Mo3-3
Optimization of planning process for fire safety analysis through application of developed software Traichel, Anke (GERMANY)		08-Mo3-4
A Monte Carlo simulation platform of housing fires in Finland forecasting life and property loss Karhula, Teemu (FINLAND)		08-Mo3-5

23S-Mo3	Risk analysis methodologies in marine safety	
Kino K13		
13:50 – 15:10	Chair: Pentti Kujala (FINLAND)	Offshore
Simulation model for evaluation of effectiveness of maritime SAR services Goerlandt, Floris (FINLAND)		23S-Mo3-1
The effects of an enhanced navigation support information service on maritime traffic risks in the Gulf of Finland Hänninen, Maria (FINLAND)		23S-Mo3-2
Evaluation of traffic increase in the Gulf of Finland 2007-2015 and the effect of the increase on the environment and traffic chain activities Lehikoinen, Annukka (FINLAND)		23S-Mo3-3
Probabilistic model of minimal passing distances of vessels navigating in Polish coastal waters Marcjan, Krzysztof (POLAND)		23S-Mo3-4
A model for risk analysis of RoPax ships - the Gulf of Finland case Montewka, Jakub (FINLAND)		23S-Mo3-5

16A-Mo4	PRA development – overview	
Europaea		
15:40 – 17:00	Chair: Risto Himanen (FINLAND)	PRA NPP

PSA use and development: an international overview by WGRISK Lanore, Jeanne-Marie (FRANCE)	16A-Mo4-1
Application of ASME PRA Standard on Swedish PSA Studies Bäckström, Ola (SWEDEN)	16A-Mo4-2
Status and Perspectives of PSA activities in Belgium Gryffroy, Dries (BELGIUM)	16A-Mo4-3
Development of a Full Scope, Integrated, Modern PSA Suitable for Risk-Informed Applications at KKL Nusbaumer, Olivier (SWITZERLAND)	16A-Mo4-4
Chasing a Moving Target: Applying Safety Goals on a Living PSA Bengtsson, Lisa (SWEDEN)	16A-Mo4-5

16BS-Mo4	Passive systems – innovative reactor concepts	
Fennia 2		
15:40 – 17:00	Chair: Francesco Di Maio (ITALY)	PRA NPP

A Reliability Assessment Method for VHTR Passive Safety Systems Jae, Moosung (KOREA (REP.))	16BS-Mo4-1
Integration of the functional reliability of two passive safety systems to mitigate a SBLOCA+BO in a CAREM-like reactor PSA Mezio, Federico (ARGENTINA)	16BS-Mo4-2
Qualification of methodologies for reliability analysis of passive system against experimental data Araneo, Dino (ITALY)	16BS-Mo4-3
Quantification of the Spent Fuel Pool Cooling System Contribution to the AP1000® Plant Core Damage Frequency and Large Release Frequency Masset, Yves (UNITED STATES)	16BS-Mo4-4

27-Mo4	Key issues in HRA development	
Fennia 1		
15:40 – 17:00	Chair:	Human org

Bridging Human Reliability Analysis and Psychology, Part 2: A Cognitive Framework to Support HRA Whaley, April (UNITED STATES)	27-Mo4-1
Bridging Human Reliability Analysis and Psychology, Part 1: The Psychological Literature Review for the IDHEAS Method Whaley, April M. (UNITED STATES)	27-Mo4-2
SPAR-H Step-by Step Guidance Whaley, April M. (UNITED STATES)	27-Mo4-3
Guidance on Dependence Assessment in SPAR-H Whaley, April M. (UNITED STATES)	27-Mo4-4
Probabilistic assessment of knowledge-based behaviour by use of cognitive-science findings and concepts by Swain Fassmann, Werner (GERMANY)	27-Mo4-5

17:00 – 17:30	Fruit break
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29-Mo4	Dana Kelly memorial: Epistemic uncertainties 1		
Nordia			
15:40 – 17:00	Chair:		Epistemic
Effect of epistemic uncertainty modelling approach on decision-making: Example using equipment performance indicator Youngblood, Robert (UNITED STATES)			29-Mo4-1
Imprecise Dirichlet Model for Common-Cause Failure Troffaes, Matthias (UNITED KINGDOM)			29-Mo4-2
A bottom-up procedure to calculate the Top Event probability in presence of epistemic uncertainty Curcurù, Giuseppe (ITALY)			29-Mo4-3
Treatment of epistemic uncertainty in environmental fate models – Consequences on chemical safety regulatory strategies Iqbal, M. Sarfraz (SWEDEN)			29-Mo4-4
Optimizing computer representation and computer processing of epistemic uncertainty for risk-informed decision making: Finances etc. Kreinovich, Vladik (UNITED STATES)			29-Mo4-5
01S-Mo4	Covariate-driven maintenance		
Nautica			
15:40 – 17:00	Chair: Roger Flage (NORWAY)		Maintenance
Dempster-Shafer Theory of Evidence to handle maintenance models tainted with imprecision Compare, Michele (ITALY) >>> Moved to session 13-Fr2			01S-Mo4-1
Petri-Net Simulation Model of a Nuclear Component Degradation Process Li, Yanfu (FRANCE)			01S-Mo4-2
A maintenance model based on an estimated stress indicator of failure modes for industrial components. Application to wind turbines Sanz-Bobi, Miguel A. (SPAIN)			01S-Mo4-3
11-Mo4	Risk assessment 1		
Press Room			
15:40 – 17:00	Chair: Radim Bris (CZECH REPUBLIC)		Risk generic
Uncertainty Analysis for Large Dam Failure Frequencies based on Historical Data Ferrante, Fernando (UNITED STATES)			11-Mo4-1
Framework for the adjustment of failure frequencies in quantitative risk assessment methodologies Laheij, Gerald (NETHERLANDS)			11-Mo4-2
Time-dependent risk modeling of accidental events and responses in process Industries Bris, Radim (CZECH REPUBLIC)			11-Mo4-3
Severe fatal accident risk in the oil chain – Frequency and severity analysis using a Bayesian hierarchical model Eckle, Petrisa (SWITZERLAND)			11-Mo4-4

24-Mo4	Water systems	
Baltica		
15:40 – 17:00	Chair: Sarah LaRocca (UNITED STATES)	Infra

Method of safety analysis of water supply systems Zimoch, Izabela (POLAND)	24-Mo4-1
Analysis of Water Distribution Networks Topology to Support Vulnerability Assessment Hernando Gomez Castro, Camilo (UNITED STATES)	24-Mo4-2
Maps of risk in water distribution subsystem Boryczko, Krzysztof (POLAND)	24-Mo4-3
Risk Analysis of Guaranteed Level of Waterworks Services Availability Model and Methodology Pietrucha-Urbanik, Katarzyna (POLAND)	24-Mo4-4
The Identification of Threats to the Source of Emergency Water Supply Bumbova, Alena (CZECH REPUBLIC)	24-Mo4-5

17-Mo4	Methodological approaches to support risk management	
Marine Room		
15:40 – 17:00	Chair: Garreth Parry (UNITED STATES)	Risk manag

On Developing Methods of Defining a List of Beyond Design Basis Accidents to Be Taken Into Account in a NPP Design Lankin, Mikhail (RUSSIAN FEDERATION)	17-Mo4-1
Establishing a Balance between the Principles of Risk-Informed Decision-Making Related to Making Changes to the Licensing Basis True, Doug (UNITED STATES)	17-Mo4-2
Assessing the governance of the organizations: risks, resiliencies and sustainable development Merad, Myriam (FRANCE)	17-Mo4-3
Advanced Nuclear Fuel Cycle Decision-Making Tool Dykes, Andrew A. (UNITED STATES)	17-Mo4-4
Computer-assisted Risk Assessment Audit on Operational Level Mock, Ralf (SWITZERLAND)	17-Mo4-5

17:00 – 17:30	Fruit break
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09-Mo4	Structural reliability and degradation modeling 2	
Eliel (hotel)		
15:40 – 17:00	Chair:	Structural
X-ray endoscopy for inspection of tube-to-tube sheet welds in heat exchangers Zscherpel, Uwe (GERMANY)		09-Mo4-1
Stochastic modelling in fracture mechanics to assess failure probability Elegbede, Charles (FRANCE)		09-Mo4-2
Risk-Based Integrity Assessment and Failure Probabilities of a Residential Single Wall Steel Aboveground Fuel Oil Storage Tank Nazir, Muddassir (CANADA)		09-Mo4-3
Mobile X-Ray Computed Tomography for Nuclear and Aviation Industry Redmer, Bernhard (GERMANY)		09-Mo4-4

14-Mo4	Risk assessment – consequence analysis	
Selim (hotel)		
15:40 – 17:00	Chair: Pieter van Gelder (NETHERLANDS)	Accident
Model of Spray System Work in the Process of Severe Accident at Nuclear Power Plant Aleshin, Vladimir (RUSSIAN FEDERATION)		14-Mo4-1
Explosion Risk Analysis of Large Floaters Storch, Raphael (NORWAY)		14-Mo4-2
Explosion Risk Analysis based on experience databases from Computational Fluid Dynamics results Huser, Asmund (NORWAY)		14-Mo4-3
Safe optimization of potentially runaway processes using topology based tools and software Copelli, Sabrina (ITALY)		14-Mo4-4

16C-Mo4	Codes and tools 1	
Kino K13		
15:40 – 17:00	Chair:	PRA NPP
Integrated versus non-integrated Level 1 – Level 2 model, sharing experience with both approaches Kollasko, Heiko (GERMANY)		16C-Mo4-2
Fault Tree Auto-Generator: How to Cope with Highly Redundant Systems Herb, Joachim (GERMANY)		16C-Mo4-3
Oskarshamn – Modernization of PSA documentation Kristensson, Andreas (SWEDEN)		16C-Mo4-4
Development of Software for Low Power and Shutdown PSA Modeling Han, Sang Hoon (KOREA (REP.))		16C-Mo4-5

16A-Mo5	Dynamic PRA	
Europaea		
17:30 – 18:30	Chair: Antoine Rauzy (FRANCE)	PRA NPP
Some Issues with Quantification of Station Blackout Sequences and Methods of Solution Fleming, Karl (UNITED STATES)		16A-Mo5-1
Options to Consider Reliability Information in a Dynamic PSA with the MCDET Method Peschke, Jörg (GERMANY)		16A-Mo5-2
Calculation of damage frequencies without success criteria hypothesis. Application to MBLOCA sequences Salazar, Cesar Queral (SPAIN) >>> Moved to session 02-We2		16A-Mo5-3
Simulation of Nuclear Power Plant Operators Reasoning Process for Situation Assessment in ADS-IDAC Dynamic PRA Platform Li, Yuandan (UNITED STATES)		16A-Mo5-4

16BS-Mo5	Passive systems – advanced reactors	
Fennia 2		
17:30 – 18:30	Chair: Dennis Henneke (UNITED STATES)	PRA NPP
Probabilistic Safety Assessment for The Advanced Boiling Water Reactor KERENA Abusharkh, Yousef (GERMANY)		16BS-Mo5-1
Passive Systems Reliability – Application of MELCOR Simulations for PCCS Case Study Männistö, Ilkka (FINLAND)		16BS-Mo5-2
Long-term Station Blackout Risk for The Advanced Passive Boiling Water Reactor Design - ESBWR Henneke, Dennis (UNITED STATES)		16BS-Mo5-3

27-Mo5	HRA in team and organization level	
Fennia 1		
17:30 – 18:30	Chair: David Embrey (UK)	Human org
Assessment of Organizational Factors in the HRA Context Hartung, Jürgen (GERMANY)		27-Mo5-1
The use of SNA metrics to investigate the relationship between the characteristics of crew communications with the associated crew performance Yang, Joon-Eon (KOREA (REP.))		27-Mo5-2
Modeling and Simulation of the Impact of Team Characteristics on Crew Performance Azarkhil, Mandana (UNITED STATES)		27-Mo5-3

19:00 – 21:00 Welcome reception at Marina Congress Center

29-Mo5	Epistemic uncertainties 2	
Nordia		
17:30 – 18:30	Chair: Enrico Zio (ITALY)	Epistemic
Options for the Treatment of Uncertainty in Seismic Safety Assessment of Nuclear Power Plants Katona, Tamas Janos (HUNGARY)		29-Mo5-1
A Nested Approach to Multivariate Modelling Using Lower Previsions Troffaes, Matthias (UNITED KINGDOM)		29-Mo5-2
Elicitation in reliability studies under epistemic uncertainty using the belief functions theory Aguirre, Felipe (FRANCE)		29-Mo5-3
Reliability in Predictive Models under Alternative Treatments of Predictive Uncertainty – QSPRs in Chemical Safety Assessments Sahlin, Ullrika (SWEDEN)		29-Mo5-4

01S-Mo5	Asset management and maintenance	
Nautica		
17:30 – 18:30	Chair:	Maintenance
Optimal Asset Management across a Network Ansell, Jake (UNITED KINGDOM)		01S-Mo5-1
Investments Portfolio Optimal Planning for industrial assets management: Method, Tool and Application Fessart, Karine (FRANCE)		01S-Mo5-2
Proactive fleet monitoring and management facilities: KASEM e-maintenance platform Monnin, Maxime (FRANCE)		01S-Mo5-3
Modelling the effect of maintenance quality on spare parts inventory Van Horenbeek, Adriaan (UNITED KINGDOM)		01S-Mo5-4

20-Mo5	Industrial analysis approaches and cases 1	
Press Room		
17:30 – 18:30	Chair: Veikko Rouhiainen (FINLAND)	Industrial
PSA-modeling of External Grid Failures Occuring Close to Nuclear Power Plants Sparre, Erik (SWEDEN)		20-Mo5-1
Power grid safety: dynamic criticality CWW-based analysis Brezhnev, Eugene (UKRAINE)		20-Mo5-2
An MCDM model for potential failure causes ranking from FMECA Alencar, Marcelo (BRAZIL)		20-Mo5-3
Evaluating effective reaction rates of kinetically driven solutes in large-scale, anisotropic media: human health risk implications in CO2 leakage Siirila, Erica (UNITED STATES)		20-Mo5-4

06-Mo5	Statistical data analysis (non-nuclear)	
Baltica		
17:30 – 18:30	Chair: Min Xie (FRANCE)	Data
	Adjustment of complex probabilistic models and estimation of confidence intervals in a discrete manner Cabarbaye, Andre (FRANCE)	06-Mo5-1
	Estimating a flaw size distribution using data from both destructive tests and non-destructive in-service inspections Keller, Merlin (FRANCE)	06-Mo5-2
	Review and comparison of goodness-of-fit tests for the exponential and Weibull distributions Krit, Meryam (FRANCE)	06-Mo5-3

17-Mo5	Regulatory insights and experiences on RI approaches	
Marine Room		
17:30 – 18:30	Chair: Henrik Kortner (NORWAY)	Risk manag
	Perspectives and Insights on Transition to Risk-Informed Performance-Based Fire Protection Programs Nourbakhsh, Hossein (UNITED STATES)	17-Mo5-1
	Robust Offshore Risk Regulation An assessment of US, UK and Norwegian Approaches Lindoe, Preben (NORWAY)	17-Mo5-2
	Risk-Informed Regulation Indicator System Macsga, Geza (HUNGARY)	17-Mo5-3

19:00 – 21:00 Welcome reception at Marina Congress Center

04-Mo5	Occupational risk modeling		
Eliel (hotel)			
17:30 – 18:30	Chair: Olga Aneziris (GREECE)		Occupational
Cost-benefit analysis in occupational health and safety: A++ proposal model Ramos, Delfina (PORTUGAL)			04-Mo5-1
What Does It Mean to Be Competent in Caring about Safety Ferjencik, Milos (CZECH REPUBLIC)			04-Mo5-2
Integrated OHS management systems: Is it the FINAL FRONTIER regarding OHS? Ramos, D. Gabriela (PORTUGAL)			04-Mo5-3
Occupational Risk Management for falling objects Aneziris, Olga (GREECE)			04-Mo5-4

16C-Mo5	Codes and tools 2		
Kino K13			
17:30 – 18:30	Chair: Jan Holmberg (FINLAND)		PRA NPP
An Overview of the Open-PSA platform Rauzy, Antoine (FRANCE)			16C-Mo5-1
Variant Management in a Modular PSA Friedlhuber, Thomas (FRANCE)			16C-Mo5-2
Studying of the Failure Tolerance with the Probabilistic Risk Assessment Ahonen, Essi (FINLAND)			16C-Mo5-3

Program Outline – Tuesday, 26 June 2012

	Europaea	Fennia 2	Fennia 1	Nordia	Nautica	Press room
08:30-09:30 Plenary session Tu1	Plenary PL-Tu1 Fukushima					
09:30-10:00	COFFEE BREAK					
10:00-11:40 Parallel sessions Tu2	PRA NPP 16S-Tu2 Fukushima accident 1			UNCERTAINTY 03S-Tu2 Uncertainty analysis 2	MAINTENANCE 01-Tu2 Condition based maintenance	INDUSTRIAL 20-Tu2 Reliability analysis
11:40-13:10	CONFERENCE LUNCHEON					
13:10-14:30 Parallel sessions Tu3	PRA NPP 16-Tu3 Fukushima - panel discussion			EPISTEMIC 29-Tu3 Model uncertainties and validation	MAINTENANCE 01-Tu3 Maintenance modeling and optimization of complex systems	RISK GENERIC 11-Tu3 Risk management 2
14:30-15:00	COFFEE BREAK					
15:00-16:20 Parallel sessions Tu4	PRA NPP 16A-Tu4 Data analysis	PRA NPP 16B-Tu4 HRA based on empirical study	HUMAN ORG 27-Tu4 Organizational learning and modeling	UNCERTAINTY 03-Tu4 Uncertainty and sensitivity	MAINTENANCE 01-Tu4 Reliability centred maintenance	INDUSTRIAL 20-Tu4 Automotive systems
16:20-16:40	FRUIT BREAK					
16:40-18:00 Parallel sessions Tu5	PRA NPP 16A-Tu5 RI applications	PRA NPP 16B-Tu5 New HRA methods 1	STRUCTURAL 09-Tu5 Reliability and concrete structures	DATA 06-Tu5 Data collection and analysis (non-nuclear)	MAINTENANCE 01-Tu5 Preventive maintenance	INDUSTRIAL 20-Tu5 Risk management


09-Mo2
 Session moved from

Baltica	Marine room	Eliel (hotel)	Selim (hotel)	Kino K13
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08:30-09:30
Plenary session
Tu1

COFFEE BREAK

09:30-10:00
10:00-11:40
Parallel sessions
Tu2

OFFSHORE	RISK MANAG	OCCUPATIONAL	RISK GENERIC	SECURITY
23-Tu2	17-Tu2	04-Tu2	11-Tu2	18-Tu2
Oil and gas risk assessment	RI inspection	Occupational risk	Risk management 1	Security methods and applications

11:40-13:10
13:10-14:30
Parallel sessions
Tu3

OFFSHORE	RISK MANAG	OCCUPATIONAL	RISK PERC	SECURITY
23-Tu3	17-Tu3	04-Tu3	12-Tu3	18-Tu3
Drilling risk assessment	PRA in risk management	Occupational risk assessment	Risk and reliability criteria	Security methods

COFFEE BREAK

14:30-15:00
15:00-16:20
Parallel sessions
Tu4

OFFSHORE	RISK MANAG	AVIATION	RISK GENERIC	PRA NPP
23-Tu4	17-Tu4	21S-Tu4	11-Tu4	16C-Tu4
Marine operations risks	Safety assessment, management and goals	Managing system changes in aviation - novel issues for PRA	Nuclear spent fuel safety	PRA Level 2 and 3

FRUIT BREAK

16:20-16:40
16:40-18:00
Parallel sessions
Tu5

OFFSHORE	MATHEMATICS	SIL	RISK GENERIC	PRA NPP
23-Tu5	02-Tu5	26-Tu5	11-Tu5	16C-Tu5
Marine transportation risk assessment	Bayesian analysis and simulation	SIL decision support	Risk assessment 2	PRA Level 2 related applications

PL-Tu1

Europa

08:30 – 09:30

Plenary session: Jukka Laaksonen (FINLAND)

Chair: David Johnson (UNITED STATES)

Plenary



Prof. Jukka Laaksonen was Director General of Radiation and Nuclear Safety Authority (STUK) of Finland from 1st April 1997 to January 31st 2012. After retirement from STUK he works with Joint Stock Company Rusatom Overseas since April 2nd 2012.

He worked in nuclear regulation from May 1974 to January 2012, mostly at STUK but also as a visiting expert at US NRC in 1981-82. In

1987-89, he worked as senior officer in the OSART team of the IAEA.

Since 1970's he has actively participated in international cooperation in the area of nuclear safety and safeguards. He has held several chairmanships in international groups and committees, among these are WENRA (Western Europe Nuclear Regulators Association (2009-2011), the OECD/NEA's Committee for Nuclear Regulatory Activities (1998-2007), the RAMG group coordinating EU support to regulators outside the EU (2001-2003), and Country Groups of three Review Meetings of the Convention of Nuclear Safety (1999, 2005, 2011). He has also lead IAEA teams (IRRS) that reviewed the regulation of nuclear safety in Russia (2009) and in the USA (2010), as well as a high level panel that reviewed the effectiveness and efficiency of the IAEA's safeguards activities (2003).

He has been a member of several standing international committees, among others the IAEA Expert Group on Multinational Nuclear Approaches (for elaboration and promotion of a safeguards and security initiative by IAEA Director General, 2004-2005), the IAEA's Commission on Safety Standards (2008-2011), the European (EU) High Level Group on Nuclear Safety and Waste Management (2007-2011), the MDEP (Multinational Design Evaluation Project) Policy Group, 2006-2011), the Forum of regulators of WWER type reactors (1997-2011), and the Safety Review Group serving European Bank for Reconstruction and Development (1993-2006).

Currently Prof. Laaksonen is Vice Chairman of INSAG (International Nuclear Safety Group connected with the IAEA) and a member of the International Advisory Board of United Arab Emirates.

Fukushima accident aftermath

The accident in Fukushima on March 2012 prompted in all countries using nuclear energy a re-evaluation of safety of their NPPs. The main focus was on factors that contributed to the severity of Fukushima accident.

The results of re-evaluation suggested several possibilities to improve the safety design of NPPs. New insights have been used to plan concrete measures for safety enhancements at the operating plants and some of the proposed measures have already been implemented. The lessons learned have also been considered for revising design principles of new NPP's.

In Europe the safety evaluation of all NPPs in operation or under construction were conducted using commonly agreed guidelines by operators and regulators of 16 countries: all EU Member States with NPPs and Switzerland and Ukraine. The national safety evaluations were peer reviewed among the regulators of the participating countries, and recommendations were made to each country. Russia was not participant of the peer review process but it made its national review using the same EU guidelines. The topics that were assessed in Europe and Russia were the robustness of protection against external natural hazards that go beyond the current design basis, protection from complete loss of electrical power and from loss of primary ultimate heat sink and severe accident management aiming to prevent large radioactive releases to the environment.

Japan was observing the European process, and the assessment of Japanese industry was targeted on the same topics as the European one. However, the review conducted in Japan was more systematic and it also included a thorough evaluation of the accident course at each severely damaged Fukushima unit, using fault tree models. These fault trees were built around the accident course and aimed to identify arrangements that would have been useful to turn the course of events at each unit to better direction.

The presentation summarizes and discusses the generic proposals that have been made in Europe, Russia and Japan on the basis of safety reassessment, and that aim to enhance safety of current type of NPPs.

Tuesday, 26 June 2012

09:30 – 10:00

Coffee break

16S-Tu2	Fukushima accident 1	
Europaea		
10:00 – 11:40	Chair: Akira Yamaguchi (JAPAN)	PRA NPP

Crossroads of severe accident and cold shutdown of nuclear power plant affected by earthquake and tsunami Yamaguchi, Akira (JAPAN)	16S-Tu2-1
A PRA Practitioner Looks at the Fukushima Daiichi Accident Epstein, Woody (JAPAN)	16S-Tu2-2
A study of Fukushima nuclear power plant accidents by the viewpoint of PSA Matsuoka, Takeshi (JAPAN)	16S-Tu2-3
Fukushima Nuclear Power Station Accident: How and Why Ogino, Masao (JAPAN)	16S-Tu2-4
Evaluation of Water Temperature and Level in a Spent Fuel Pit Murase, Michio (JAPAN)	16S-Tu2-5

Luncheon	Conference luncheon program	
Fennia 1+2		
11:40 – 13:10	Chair: Reino Virolainen (FINLAND)	Luncheon

Introduction of the George Apostolakis Fellowship Award Winners George Apostolakis
PSAM 12, Hawaii – Announcement Todd Paulos
ESREL 2013 Amsterdam – Announcement Raphael Steenbergen
Scandpower / Lloyd's Remarks Jerzy Grynblat

11:40 – 13:10	Conference luncheon (Fennia 1 and Fennia 2, second floor)
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03S-Tu2	Uncertainty analysis 2	
Nordia		
10:00 – 11:40	Chair:	Uncertainty

Propagation of aleatory and epistemic uncertainties in the model for the design of a flood protection dike Pedroni, Nicola (ITALY)	03S-Tu2-1
Uncertainty Analysis for the U.S. NRC State-of-the-Art Consequence Analyses Ghosh, S. Tina (UNITED STATES)	03S-Tu2-2
Bounding the Failure Probability Range of Polynomial Systems Subject to P-box Uncertainties Crespo, Luis (UNITED STATES)	03S-Tu2-3
A structural methodology on severe accident uncertainty assessment; integration of input, model and output Hosseini, Seyed Mohsen (IRAN (ISLAMIC REP.))	03S-Tu2-4
Phenomena Identification and Ranking for Severe Accident Uncertainty Assessment; a Systematic, Two-Dimensional Approach Hosseini, Seyed Mohsen (UNITED STATES)	03S-Tu2-5
Confidence bounds on risk assessments – Application to radiological contaminations Blatman, Géraud (FRANCE)	03S-Tu2-6

01-Tu2	Condition based maintenance	
Nautica		
10:00 – 11:40	Chair: Mitra Fouladirad (FRANCE)	Maintenance

Detection of a damaged operating mode of an optronic equipment using Hidden Markov Model Baysse, Camille (FRANCE)	01-Tu2-1
Case study for condition-based maintenance combined with on-line monitoring Fouladirad, Mitra (FRANCE)	01-Tu2-2
Possible Inputs to Maintenance Optimisation Based on Non-direct Diagnostics Valis, David (CZECH REPUBLIC)	01-Tu2-3
Condition-based maintenance for a deteriorating system subject to random shocks and environmental changes Zhu, Wenjin (FRANCE)	01-Tu2-4
Incorporating Human Error in Reliability Assessment of Condition Based Maintenance System – A Systemic Framework Asadzadeh, Seyed Mohammad (IRAN (ISLAMIC REP.))	01-Tu2-5
Spare parts optimisation subject to condition monitoring Ferreira, Rodrigo J. P. (BRAZIL)	01-Tu2-6

20-Tu2	Reliability analysis	
Press Room		
10:00 – 11:40	Chair: John Andrews (UNITED KINGDOM)	Industrial

Reliability based model that supports decision making about recovery options in the area of reverse logistics Plewa, Marcin (POLAND)	20-Tu2-1
Towards Advanced Visualization and Interaction Techniques for Fault Tree Analyses Comparing existing methods and tools Al-Zokari, Yasmin (GERMANY)	20-Tu2-2
Treating Complex Dynamics in Probabilistic Safety Assessment: a Case Study from the Process Industry Podofilini, Luca (SWITZERLAND)	20-Tu2-3
Reliability analysis of complex systems with the monte carlo simulation for system structures Plinke, Fabian (GERMANY)	20-Tu2-4
Application of phased-mission model to analyze reliability of combined rail-water transport system Nowakowski, Tomasz (POLAND)	20-Tu2-5
Reliability Model for Influencing Individuals in the Social Network Setting Ramirez-Marquez, Jose Emmanuel (UNITED STATES)	20-Tu2-6

23-Tu2	Oil and gas risk assessment	
Baltica		
10:00 – 11:40	Chair: Jan Erik Vinnem (NORWAY)	Offshore

Risk and Reliability Analyses of Dynamic Positioning for Deepwater Pipelaying Operations Zheng, Hao (CHINA)	23-Tu2-1
Application of Probabilistic Uncertainty Analysis for Modeling of Gas Pipeline Explosion Alzbutas, Robertas (LITHUANIA)	23-Tu2-2
Visualisation of risk for hydrocarbon leakages in the planning of maintenance and modification activities on offshore petroleum installations Sarshar, Sizarta (NORWAY)	23-Tu2-3
Use of RSCM in the Offshore QRA He, Xuhong (SWEDEN)	23-Tu2-4
On the analysis of hydrocarbon leaks on offshore installations in a work process context Vinnem, Jan-Erik (NORWAY)	23-Tu2-5
Validation and testing of a multi layer risk model for hydrocarbon leaks in the offshore petroleum industry Johansen, Trond Stillaug (NORWAY)	23-Tu2-6

17-Tu2	RI inspection	
Marine Room		
10:00 – 11:40	Chair: Henrik Kortner (NORWAY)	Risk manag

A Risk Based Inspection Analysis for Corroding Oil and Gas with Extended Uncertainty Analysis Berner, Christine Louise (NORWAY)	17-Tu2-1
Risk Informed Scheduling of Regulatory Inspections - A Deterministic approach to regulating operational risks of Elevating Devices Mangalam, Srikanth (CANADA)	17-Tu2-2
Inspection based on reliability growth: Defining the time of inspection periods based on Power Law reliability growth method Calixto, Eduardo (BRAZIL)	17-Tu2-3
Multi-Objective Optimization of Risk and Cost for Risk-Based Inspection Plans Lins, Isis Didier (BRAZIL)	17-Tu2-4

Luncheon	Conference luncheon program	
Fennia 1+2		
11:40 – 13:10	Chair: Reino Virolainen (FINLAND)	Luncheon

Introduction of the George Apostolakis Fellowship Award Winners George Apostolakis
PSAM 12, Hawaii – Announcement Todd Paulos
ESREL 2013 Amsterdam – Announcement Raphael Steenbergen
Scandpower / Lloyd's Remarks Jerzy Grynblat

11:40 – 13:10 Conference luncheon (Fennia 1 and Fennia 2, second floor)

04-Tu2	Occupational risk	
Eliei (hotel)		
10:00 – 11:40	Chair: Chris Winder (AUSTRALIA)	Occupational

Emissions of hazardous compounds during PVC manufacturing processes Derudi, Marco (ITALY)	04-Tu2-1
The contribution of case law to compliance management in Occupational Health and Safety (OHS) in France Audiffren, Thomas (FRANCE)	04-Tu2-2
The use of video technology as an enabling tool for risk assessment and management in a manufacturing context Cocca, Paola (ITALY)	04-Tu2-3
Clients and professionals: same places, same perception about accident risk? Loureiro, I.F. (PORTUGAL)	04-Tu2-4
Applications of Dynamic Risk Assessment Winder, Chris (AUSTRALIA)	04-Tu2-5

11-Tu2	Risk management 1	
Selim (hotel)		
10:00 – 11:40	Chair: Jake Ansell (UNITED STATES)	Risk generic

Plant lifetime management for the onshore process industry Candrea, Frank (BELGIUM)	11-Tu2-1
Nuclear Waste Facility Siting in Federal Systems: Understanding the Structure of Public Preferences in the US Jenkins-Smith, Hank (UNITED STATES)	11-Tu2-2
A systems dynamics framework for risk management of multiple autonomous underwater vehicles Brito, Mario (UNITED KINGDOM)	11-Tu2-3

18-Tu2	Security methods and applications	
Kino K13		
10:00 – 11:40	Chair:	Security

Human factors in the layers of defense in airport security Andriessen, Hinke (NETHERLANDS)	18-Tu2-1
The Relation between Terrorism Risk Discourses and Aviation Security Jore, Sissel Haugdal (NORWAY)	18-Tu2-2
Protection of Multiple Assets to Intentional Attacks: A Methodological Framework Cojazzi, Giacomo G.M. (ITALY)	18-Tu2-3
A framework for selection of strategy for management of security measures Abrahamsen, Eirik BJORHEIM (NORWAY)	18-Tu2-4
Higher Education in Informatics – Concepts and Lessons Learnt Mock, Ralf (SWITZERLAND)	18-Tu2-5
LNG regasification terminals: assessment of accidents due to external acts of interference Cozzani, Valerio (ITALY)	18-Tu2-6

16-Tu3

Europa

13:10 – 14:30

Fukushima – panel discussion

Chair: Woody Epstein, Scandpower (Japan)

Co-chair: Akira Yamaguchi, University of Osaka (JAPAN)

PRA NPP

Jukka Laaksonen	STUK
Bob Geller	Tokyo University
Roger Cooke	Resources for the Future
Elisabeth Pate-Cornell	Stanford University
Masaharu Kitamura	Tohoku University
Irina Kuzmina	IAEA
Dave Tappin	British Geological Survey
Pierre Le Bot	EDF R & D and HRA Society

Panel Discussion	
Not losing to the rain: the impact of the 3/11 earthquake and tsunami, risk assessment, and risk management.	
From the risk point of view	From the safety point of view
What went wrong?	What went right?
Was it bad luck?	Was it good luck?
Were the consequences caused by the lack of requisite imagination?	Were the consequences avoided by resilient responses?
What changes are needed in risk/safety assessment? How can we talk in plain words to the public?	

It has been 15 months since the unprecedented earthquake and tsunami struck the Tōhoku area of Japan, not only causing station black out and subsequent core damage and radioactive releases at Fukushima Daiichi, but almost 20,000 deaths, massive relocation of people, economic loss, closure of all 50 nuclear power stations in Japan, projected electric power shortages, and mistrust in government and the regulatory process. The effect has impacted not only Japan, but other countries as well.

What has 3/11 taught the practioners of risk assessment and risk management? What lessons from the disaster can we bring to policy makers and governments? How can we better explain to the public about risk and safety? Most importantly, what changes should we make in risk assessment and risk management to help navigate extreme events in the future?

This Panel Discussion will bring together experts in several different fields who will briefly describe what they have learned and engage in open discussions with each other and members of the audience. We hope that this will be a thought provoking and highly interactive session.

not losing to the rain
not losing to the wind ...

... in everything
count yourself last and put others
before you
watching, listening, understanding
and not forgetting ...

... such a person
I want to become.

From Not losing to the rain by the poet laureate of Tohoku, Miyazawa Kenji.

14:30 – 15:00

Coffee break

29-Tu3	Model uncertainties and validation	
Nordia		
13:10 – 14:30	Chair: Ali Mosleh (USA)	Epistemic

The Concept of validation of numerical models in consequence analysis Borg, Audun (NORWAY)	29-Tu3-1
Uncertainty modelling on coupled models using minimum information methods Bedford, Tim (UNITED KINGDOM)	29-Tu3-2
The Importance of Modelling Assumptions Andersson, Cilla (SWEDEN)	29-Tu3-3
An application of a new framework for model (output) uncertainty analysis in risk assessment. Bjerga, Torbjoern (NORWAY)	29-Tu3-4
Verification and Validation Process of a Fire Model McGrattan, Kevin (UNITED STATES)	29-Tu3-5

01-Tu3	Maintenance modeling and optimization of complex systems	
Nautica		
13:10 – 14:30	Chair: Radim Bris (CZECH REPUBLIC)	Maintenance

The interplay between deployment and optimal maintenance intervals for a navy frigate Tinga, Tiedo (NETHERLANDS)	01-Tu3-1
Maintenance activities planning and grouping for complex structure systems Vu, Hai Canh (FRANCE)	01-Tu3-2
Maintenance Management Models – a deciding tool for achieving a world-class maintenance function? Harald, Rødseth (NORWAY)	01-Tu3-3
A modelling language for maintenance task scheduling Reed, Sean (UNITED KINGDOM)	01-Tu3-4
Reliability-dependent choice of spare part provision and maintenance strategies at optimal cost as an offered service Appel, Dominic (GERMANY)	01-Tu3-5

11-Tu3	Risk management 2	
Press Room		
13:10 – 14:30	Chair: Jake Ansell (UNITED KINGDOM)	Risk generic

Semi-formal safety requirement specification using SysML state machine diagrams Häring, Ivo (GERMANY)	11-Tu3-1
The environmental integration of safety aspects into the urban development design. Suddle, Shahid (NETHERLANDS)	11-Tu3-2
Systems engineering approach for the Construction risks of building spanning an underpass Suddle, Shahid (NETHERLANDS)	11-Tu3-3
Development of a Tool to Present the External Emergency Planning Zones in Belgium Nourry, Joachim (BELGIUM)	11-Tu3-4

23-Tu3	Drilling risk assessment	
Baltica		
13:10 – 14:30	Chair: Jan Erik Vinnem (NORWAY)	Offshore

Reliability performance of technical systems: A case study in relation to drilling operations Håbrekke, Solfrid (NORWAY)	23-Tu3-1
BOP risk and reliability model to give critical decision support for offshore drilling operations Alme, Inge A. (NORWAY)	23-Tu3-2
In the aftermath of the Deepwater Horizon accident: Inadequate risk management as a common feature of major offshore well operation accidents Okstad, Eivind (NORWAY)	23-Tu3-3
Investigation of oil-well drilling problems in an Iranian central field using computational fluid dynamics Owrangi, Mojtaba (IRAN (ISLAMIC REP.))	23-Tu3-4

17-Tu3	PRA in risk management	
Marine Room		
13:10 – 14:30	Chair: Ari Julin (FINLAND)	Risk manag

A Technical Overview and Future Plans of Development of AESJ Standards for PRA Narumiya, Yoshiyuki (JAPAN)	17-Tu3-1
Unforeseen Events, PRA, and Resilience Epstein, Woody (JAPAN)	17-Tu3-2
Interaction between Industry and Regulator to Improve Quality of the PSA Lankin, Mikhail (RUSSIAN FEDERATION)	17-Tu3-3
Probabilistic Investigations to Support Risk-Informed Decision-making: Experiences and Perspective Spitzer, Cornelia (GERMANY)	17-Tu3-4

14:30 – 15:00	Coffee break
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04-Tu3	Occupational risk assessment	
Eliei (hotel)		
13:10 – 14:30	Chair: Olga Anezeris (GREECE)	Occupational

Models and tools supporting the development and the evaluation of occupational safety and health interventions Masi, Donato (ITALY)	04-Tu3-1
Developing, Implementing and Evaluating OSH Interventions in SMEs: an Exploratory Study Masi, Donato (ITALY)	04-Tu3-2
Risk decision in occupational environments: The Portuguese reality Rodrigues, Matilde (PORTUGAL)	04-Tu3-3
Major accidents in industrial enterprises and occupational safety Suchardova, Petra (CZECH REPUBLIC)	04-Tu3-4

12-Tu3	Risk and reliability criteria	
Selim (hotel)		
13:10 – 14:30	Chair: Kevin Coyne (UNITED STATES)	Risk perc

Reliability test qualification requirements for mechanical systems; setting the standards Pourgol-Mohammad, Mohammad (IRAN (ISLAMIC REP.))	12-Tu3-1
The contribution of knowledge bases to compliance assessment: a case study of industrial maintenance in the gas sector. Bourreau, Lea (FRANCE)	12-Tu3-2
Environmental risk acceptance criteria in the Norwegian offshore petroleum industry – shortcomings and possible improvements Kråkenes, Tony (NORWAY)	12-Tu3-3
Criteria for the Acceptance of Risks Related To Human Interactions within the Railway System Antova, Maria (FRANCE)	12-Tu3-4

18-Tu3	Security methods	
Kino K13		
13:10 – 14:30	Chair: Stefan Hirschberg (SWITZERLAND)	Security

Implementation of quantum cryptography Nowakowski, Tomasz (POLAND)	18-Tu3-1
A framework for integrating economic evaluation and risk assessment to support policymakers' security-related decisions Räikkönen, Minna (FINLAND)	18-Tu3-2
On prediction of QoS of SCADA accounting cyber attacks Minichino, Michele (ITALY)	18-Tu3-3
Applying a Hybrid Decision Analysis Approach to Prioritize Cybersecurity Risk Katsumata, Peter (UNITED STATES)	18-Tu3-4
Vulnerability analysis using tree diagrams Valis, David (CZECH REPUBLIC)	18-Tu3-5

16A-Tu4	Data analysis	
Europaea		
15:00 – 16:20	Chair: Antti Toppila (FINLAND)	PRA NPP

- An Approach to Estimating the Reliability of Degraded Piping for Nuclear Power Plant Risk Assessments
Coyne, Kevin (UNITED STATES) 16A-Tu4-1
- A study of the introduction of PFM analysis for the LOCA initiating event frequency at Japanese NPPs
Mamizuka, Yutaka (JAPAN) 16A-Tu4-2
- Pros & cons of using a multi-parametric model for assessing reliability parameters in nuclear PSA
Swaling, Vidar H. (SWEDEN) 16A-Tu4-3
- On applications concerning OECD pipe failure database OPDE
Cronvall, Otso (FINLAND) 16A-Tu4-4

16B-Tu4	HRA based on empirical study	
Fennia 2		
15:00 – 16:20	Chair: Anthony Spurgin (UNITED STATES)	PRA NPP

- Results and insights derived from the intra-method comparisons of the US empirical HRA benchmarking study
Dang, Vinh (UNITED STATES) 16B-Tu4-1
- Conclusions on Human Reliability Analysis (HRA) Methods from the International HRA Empirical Study
Bye, Andreas (UNITED STATES) 16B-Tu4-2
- Overview and Preliminary Results of the US Empirical HRA Study
Bye, Andreas (NORWAY) 16B-Tu4-3
- Multi Methods Approach to Human Performance Modeling and HRA: A Field Assessment
Boring, Ronald (UNITED STATES) 16B-Tu4-4
- Insights from Development and Application of EPRI/NRC Fire HRA Guidance
Chapman, Jim (UNITED STATES) 16B-Tu4-5

27-Tu4	Organisational learning and modeling	
Fennia 1		
15:00 – 16:20	Chair: Ben Ale (NETHERLANDS)	Human org

- Risk management of resupplying power to railways from the Parisian Metro Centralized Command Center
Jubert, Fabrice (FRANCE) 27-Tu4-1
- Organizational learning as a vehicle for providing organizational health and safety culture
Tkatsova, Laura (ESTONIA) 27-Tu4-2
- Nuclear Industry Organizations: Shaped by Accidents
Spurgin, Anthony (UNITED STATES) 27-Tu4-3
- Modelling risk in high hazard operations: integrating technical, organisational and cultural factors
Ale, Ben J.M. (NETHERLANDS) 27-Tu4-4

16:20 – 16:40	Fruit break
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03-Tu4	Uncertainty and sensitivity
Nordia	
15:00 – 16:20	Chair: Martina Kloos (GERMANY) Uncertainty

Sensitivity analysis for the tolerancing of gear profiles with stochastic errors Rajabalinejad, Mohammad (NETHERLANDS)	03-Tu4-1
Probabilistic modelling and uncertainty analysis of extreme weight of snow Cesnulyte, Vaida (FINLAND)	03-Tu4-2
Development of a surrogate model and sensitivity analysis for an atmospheric dispersion computer code Marrel, Amandine (FRANCE)	03-Tu4-3
Sensitivity analyses supplemented to epistemic uncertainty analyses for PSA results Kloos, Martina (GERMANY)	03-Tu4-4

01-Tu4	Reliability centred maintenance
Nautica	
15:00 – 16:20	Chair: Christophe Berenguer (FRANCE) Maintenance

Framework to assess RCM software tools Barberá, Luis (SPAIN)	01-Tu4-1
Options of effectiveness improvement of the RCM process Kamenicky, Jan (CZECH REPUBLIC)	01-Tu4-2
RCM outputs utilization in optimizing production process Zajicek, Jaroslav (CZECH REPUBLIC)	01-Tu4-3

20-Tu4	Automotive systems
Press Room	
15:00 – 16:20	Chair: Industrial

Reliability allocation of a vehicle with regard to warranty costs Vintr, Tomas (CZECH REPUBLIC)	20-Tu4-1
Handling Product Variants in the Safety Engineering Lifecycle Ciocanescu, Ioana (GERMANY)	20-Tu4-2
GOBI and OASIS - A concept and its realization for model-based situation descriptions compliant to ISO 26262 Kemmann, Sören (GERMANY)	20-Tu4-3
ARID - A model-based risk analysis approach Kemmann, Sören (GERMANY)	20-Tu4-4

23-Tu4

Marine operations risks

Baltica

15:00 – 16:20

Chair: Stein Haugen (NORWAY)

Offshore

Collision between offshore supply vessels and offshore installations
Haugen, Stein (NORWAY)

23-Tu4-1

Integration of Operation Management and Risk Assessment Using Hierarchical Task Analysis
Batalden, Bjørn-Morten (NORWAY)

23-Tu4-2

The Use of the TSAR to Investigate the Aging Effects on Selected Elements of Ship Propulsion System
Mitomo, Nobuo (JAPAN)

23-Tu4-3

Oil tanker transportation risk: driving factors and consequence assessment
Burgherr, Peter (SWITZERLAND)

23-Tu4-4

17-Tu4

Safety assessment, management and goals

Marine Room

15:00 – 16:20

Chair: Anders Olsson (SWEDEN)

Risk manag

Model-based development of a safety concept
Kemmann, Sören (GERMANY)

17-Tu4-1

Synergy between DyPASI and well-known safety indicator methodologies
in the prevention of atypical accident scenarios
Paltrinieri, Nicola (ITALY)

17-Tu4-2

Safety Goals in Application to Nuclear Installations
Kuzmina, Irina (SWEDEN)

17-Tu4-3

OECD/NEA Project on Methods for Safety Assessment for Geological Disposal Facilities
for Radioactive Waste (MeSA): Results and Conclusions
Röhlig, Klaus-Jürgen (GERMANY)

17-Tu4-4

16:20 – 16:40

Fruit break

21S-Tu4	Managing system changes in aviation – novel issues for PRA	
Eliei (hotel)		
15:00 – 16:20	Chair: Carlo Cacciabue (ITALY)	Aviation

Managing risk in real contexts with scarcity of data and high potential hazards: the case of flights in airspace contaminated by volcanic ash Cacciabue, Pietro Carlo (ITALY)	21S-Tu4-1
A methodology for managing system change – An airline case study developing a safety performance management system McDonald, Nicholas (SWEDEN)	21S-Tu4-2
Integrated Data Management for handling hazard of change situations: a sample case of operational implementation Cassani, Mirella (ITALY)	21S-Tu4-3
A Learning, Training & Mentoring Framework (LTM) & the Role of Serious Games to Facilitate Sustainable Change in the Aviation Industry Zon, Rolf (NETHERLANDS)	21S-Tu4-4
Performance Management in a Small Regional Airport, from Day to Day Data Collection to Resilience Leva, Maria Chiara (IRELAND)	21S-Tu4-5

11-Tu4	Nuclear spent fuel safety	
Selim (hotel)		
15:00 – 16:20	Chair: Kevin McMahon (UNITED STATES)	Risk generic

Sensitivity Analysis of Seals Permeability and Performance Assessment of Deep Borehole Disposal of Radioactive Waste Hadgu, Teklu (UNITED STATES)	11-Tu4-1
Performance of neutron radiation shielding material (U)HMW-PE influenced by gamma radiation Wolff, Dietmar (GERMANY)	11-Tu4-2
Experience with the loading of storage casks and particular with respect of the drying prior long term storage Hueggenberg, Roland (GERMANY)	11-Tu4-3

16C-Tu4	PRA Level 2 and 3	
Kino K13		
15:00 – 16:20	Chair: Eva-Maria Pauli (GERMANY)	PRA NPP

A Study on the measure of Large Early Release Frequency in PSA Jae, Moosung (KOREA (REP.))	16C-Tu4-1
Level 2 PRA modelling at OL1 and OL2 nuclear power plants Tarkiainen, Antti (FINLAND)	16C-Tu4-2
Level 2 PSA studies of WWER440 type reactors in Slovakia Kovacs, Zoltan (SLOVAKIA)	16C-Tu4-3
Level 2 Probabilistic Safety Assessment for the NPP Krüemmel Schubert, Bernd (GERMANY)	16C-Tu4-4

16A-Tu5	RI applications	
Europaea		
16:40 – 18:00	Chair: Ari Julin (FINLAND)	PRA NPP

Current Status and Development of Risk Informed Event Analysis in Finland Laitonen, Janne (FINLAND)	16A-Tu5-1
Understanding plant fire risk and visualizing a safe shutdown strategy using PRISM – A case study focusing on plant modifications and risk reduction Theisen, Mitchell (UNITED STATES)	16A-Tu5-2
Application of Risk-informed Operational Event Analysis in China Huang, Qian (CHINA)	16A-Tu5-3
Risk-informed classification and treatment of structures, systems and components – A 10CFR50.69 pilot study O'Regan, Patrick (UNITED STATES)	16A-Tu5-4
Risk-Informed Safety Margin Characterization Methods Smith, Curtis (UNITED STATES)	16A-Tu5-5

16B-Tu5	New HRA methods 1	
Fennia 2		
16:40 – 18:00	Chair:	PRA NPP

Towards an Improved HRA Model for Estimation of HEPs Lois, Erasmia (UNITED STATES)	16B-Tu5-1
Suggestions for improvement in emergency operating procedure through operator behavior analysis of simulated emergency Choi, Sun Yeong (KOREA (REP.))	16B-Tu5-2
MERMOS catalogue: use of generic analyses to improve the HRA method Le Bot, Pierre (FRANCE)	16B-Tu5-3
Migration from HCR to TRC model in the context of the human reliability analysis in the PRA of Vandellós II NPP Nos, Vicente (SPAIN)	16B-Tu5-4
Microworlds, Simulators, and Simulation: Framework for a Benchmark of Human Reliability Data Sources Boring, Ronald (UNITED STATES)	16B-Tu5-5

09-Mo2	Reliability and concrete structures	
Fennia 1	This session has been moved from Monday: 09-Mo2	
16:40 – 18:00	Chair: Jana Markova (CZECH REPUBLIC)	Structural

Evaluation of reliability of existing intermediate floor beams of reinforced concrete Derry, Markus (FINLAND)	09-Mo2-1
Probabilistic analysis of structures in serviceability conditions Markova, Jana (CZECH REPUBLIC)	09-Mo2-2
Influence of a new CUSUM based conformity inspection scheme for EN 206-1 on the safety level of concrete structures Van Coile, Ruben (BELGIUM)	09-Mo2-3
Verification of Existing Reinforced Concrete Bridges using the Design Value Method Markova, Jana (CZECH REPUBLIC)	09-Mo2-4

06-Tu5	Data collection and analysis (non-nuclear)	
Nordia		
16:40 – 18:00	Chair: Kevin Wilson (UNITED KINGDOM)	Data

Field data analysis with reduced sample sizes: A case study using the optimised multi-stage sampling procedures (OMSP) concept Haller, Stephan (GERMANY)	06-Tu5-1
Failure data analysis of an oil refinery centrifugal pumps Gaspar, Daniel (PORTUGAL)	06-Tu5-2
Failure frequency assessment for high pressure and large diameter pipelines Tallone, Fabrizio (ITALY)	06-Tu5-3
Benchmarking Accident and Reporting Rates Across Locations and Supervisors: An Application of Detection Controlled Estimation Jablonowski, Christopher (UNITED STATES)	06-Tu5-4
Failure causes for pipelines transporting hazardous substances Hansler, Rikkert (NETHERLANDS)	06-Tu5-5
Collection and analysis of input data for probabilistic assessment of hygro-thermal performance of building Sadovsky, Zoltan (SLOVAKIA)	06-Tu5-6

01-Tu5	Preventive maintenance	
Nautica		
16:40 – 18:00	Chair: Roger Flage (NORWAY)	Maintenance

Optimal replacement policy under time-varying minimal repair costs and a random time horizon Khatab, Abdelhakim (FRANCE)	01-Tu5-1
Sensitivity analysis of the optimal parameter of block-replacement policy for a gamma degradation process Paroissin, Christian (FRANCE)	01-Tu5-2
A virtual age model for components with initial degradation Pérez Ramírez, Pedro A. (NORWAY)	01-Tu5-3
A preventive maintenance policy for a bivariate wear indicator with continuous monitoring Pham, Hai Ha (FRANCE)	01-Tu5-4
On the inescapability of aging in an imperfect preventive maintenance model Segovia, MCarmen (BELGIUM)	01-Tu5-5

20-Tu5	Risk management	
Press Room		
16:40 – 18:00	Chair: Bernt Leira (NORWAY)	Industrial

Key Risk Measures for the Risk-Informed Prioritization of Engineering Projects Jyrkama, Mikko (CANADA)	20-Tu5-1
Integrated risk management system based on IPL concept for chemical processes Shimada, Yukiyasu (JAPAN)	20-Tu5-2
Risk based approaches for indicators identification: Insights from the field. Mazri, Chabane (FRANCE)	20-Tu5-3
Major Industrial Accident Prevention in Slovak Republic and project MOPORI Zánická Hollá, Katarína (SLOVAKIA)	20-Tu5-4

23-Tu5	Marine transportation risk assessment	
Baltica		
16:40 – 18:00	Chair: Pentti Kujala (FINLAND)	Offshore

Development of a Method for Maritime Accident Analysis with ET Mitomo, Nobuo (JAPAN)	23-Tu5-1
A method for assessment of target overlook in navigation watch Yoshimura, Kenji (JAPAN)	23-Tu5-2
Artificial Force Fields for Multi-agent Simulations of Maritime Traffic and Risk Estimation Xiao, Fangliang (NETHERLANDS)	23-Tu5-3
Ballast Water Risk Estimation Incorporating Fuzzy-Infection Mode and Effect Analysis Wang, Jin (UNITED KINGDOM)	23-Tu5-4

02-Tu5	Bayesian analysis and simulation	
Marine Room		
16:40 – 18:00	Chair:	Mathematics

Assessment of Bayesian estimation methods for technical reliability data Bauer, Oliver (GERMANY)	02-Tu5-1
Generic Form of Bayesian Monte Carlo For Models With Partial Monotonicity Rajabalinejad, Mohammad (NETHERLANDS)	02-Tu5-2
Bayesian Subset Simulation : a kriging-based subset simulation algorithm for the estimation of small probabilities of failure Bect, Julien (FRANCE)	02-Tu5-3
Bayesian calibration of the Pasture Simulation Model (PaSim) to simulate European grasslands under climate extremes: case study at Stubai (Austria) Ben Touhami, Haythem (FRANCE)	02-Tu5-4
A Bayesian Framework for Life Cycle Reliability Estimation of New Product Xie, Min (HONG KONG, CHINA PR)	02-Tu5-5

26-Tu5	SIL decision support	
Eliel (hotel)		
16:40 – 18:00	Chair: Jan Holmberg (FINLAND)	SIL

Optimal prooftests for Safety Instrumented Systems based on maintenance models Machleidt, Konstantin (GERMANY)	26-Tu5-1
Joint using the deterministic and probabilistic approaches to improve the safety analysis of a system de Reffye, Jerome (FRANCE)	26-Tu5-2
Functional safety assessment within the risk informed decision making process Kosmowski, Kazimierz, Tadeusz (POLAND)	26-Tu5-3
Computer aided functional safety management using ProSIL system Kosmowski, Kazimierz (POLAND)	26-Tu5-4

11-Tu5	Risk assessment 2	
Selim (hotel)		
16:40 – 18:00	Chair:	Risk generic

Managing Risk Through Safety Barrier Analysis Sobral, Jose (PORTUGAL)	11-Tu5-1
Infrastructure Security and All Hazards Risk Assessment Approach for the Water Sector Rees, Daniel (UNITED STATES)	11-Tu5-2
Positively Influencing Safety through a Tailored Probabilistic Assessment of Refuelling Operations Loudoun, James (UNITED KINGDOM)	11-Tu5-3
Contribution to a concept of robustness for risk management for critical infrastructure Krauss, Matias (GERMANY)	11-Tu5-4

16C-Tu5	PRA Level 2 related applications	
Kino K13		
16:40 – 18:00	Chair: Antti Tarkiainen (FINLAND)	PRA NPP

Evaluation of source term distributions in Level 2 PSA with a fast running Monte Carlo transport code Pauli, Eva-Maria (GERMANY)	16C-Tu5-1
The Analysis of Severe Accident Induced Steam Generator Tube Rupture and Mitigation Measure Peng, Chang-Hong (CHINA)	16C-Tu5-2
Very fast running codes for the characterization of severe accident radiological consequences and the results presentation in level 2 PSA Durin, Thomas (FRANCE)	16C-Tu5-3
Human Reliability Analysis for the updated Level 2 PSA in Belgium Oury, Laurence (BELGIUM)	16C-Tu5-4

Program Outline – Wednesday, 27 June 2012

Europa	Fennia 2	Fennia 1	Nordia	Nautica	Press room
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08:30-09:30 Plenary session We1
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Plenary
PL-We1
1

09:30-10:00

COFFEE BREAK

10:00-11:40 Parallel sessions We2
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PRA NPP	PRA NPP	HUMAN ORG	OFFSHORE	MAINTENANCE	MATHEMATICS
16AS-We2	16BS-We2	27-We2	23-We2	01-We2	02-We2
Fukushima accident 2	Very long term storage of radioactive waste 1	Risk and safety behavior	Offshore risk management	Overview, discussions and new approaches	Dynamic analysis

11:40-13:10

LUNCH BREAK

13:10-14:30 Parallel sessions We3
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PRA NPP	PRA NPP	HUMAN ORG	MATHEMATICS	MAINTENANCE	INDUSTRIAL
16A-We3	16BS-We3	27-We3	02S-We3	01-We3	20-We3
New HRA methods 2	Very long term storage of radioactive waste 2	Safety culture in complex systems	Bayesian network applications 1	Modeling tools and software for maintenance analyses	RAMS 1

14:30-15:00

COFFEE BREAK

15:00-16:40 Parallel sessions We4
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PRA NPP	PRA NPP	HUMAN ORG	MATHEMATICS	MAINTENANCE	MATHEMATICS
16A-We4	16B-We4	27-We4	02AS-We4	01-We4	02B-We4
Shutdown and spent fuel analyses	Advances in fault tree and event tree methods	Safety culture and indicators	Bayesian network applications 2	Predictive maintenance	Reliability analysis

19:00

Bus transfers for the Conference Dinner

Baltica	Marine room	ElieI (hotel)	Selim (hotel)	Kino K13
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08:30-09:30
Plenary session
We1

COFFEE BREAK

EXTERNAL	RISK MGMT	STOCHASTIC	DSS	INDUSTRIAL
22-We2	17S-We2	08-We2	07-We2	20-We2
External hazards 1	Severe accident management guidance	Stochastic and numerical simulation for reliability and risk analysis	DSS case studies	Fires and explosions

09:30-10:00
10:00-11:40
Parallel sessions
We2

LUNCH BREAK

EXTERNAL	SIL	SOFTWARE	AVIATION	STRUCTURAL
22-We3	26-We3	10-We3	21-We3	09-We3
Seismic risk - applications	SIL specific issues	I&C reliability models 1	Critical issues in aviation - safety performance 1	Structural reliability and degradation modeling 3

11:40-13:10
13:10-14:30
Parallel sessions
We3

COFFEE BREAK

EXTERNAL	RISK PERC	TRANSPORT	AVIATION	INFRA
22-We4	12-We4	28-We4	21-We4	24S-We4
Seismic risk - methodology	Risk perception and communication	Railway safety	Aviation safety management	Vulnerability of critical infrastructures 1

14:30-15:00
15:00-16:40
Parallel sessions
We4

Session moved from

24S-Th5



INFRA
24S-We5
Vulnerability of critical infrastructures 2

19:00

PL-We1

Europaea

08:30 – 09:30

Plenary session: Ashok Thadani (USA)

Chair: Cornelia Spitzer (GERMANY)

Plenary



Mr. Ashok Thadani has been a consultant to domestic and international organizations on nuclear safety matters since July 2006. Currently, he is Chairman of the Nuclear Safety Committee reporting to the Nuclear Safety Authority Commission of France.

From 1974 to his retirement in 2006, he worked at the Nuclear Regulatory Commission. Mr. Thadani held progressively responsible manage-

ment positions including Associate Director of the Office of Nuclear Reactor Regulation, Director of the Office of Nuclear Regulatory Research, and Deputy Executive Director of NRC.

He was at the forefront of activities directed toward investigating and resolving major nuclear safety issues as well as assessing new and innovative nuclear power plant designs and technologies. He was extensively and personally engaged in developing safety requirements and directing NRC's technical reviews of advanced light water reactor designs (ABWR, AP-600 which was uprated to AP-1000, and Systems 80+). Throughout his career he has been tasked to lead response to some of the most significant challenges that have won him recognition for technical and management excellence. He has been a recipient of many awards including two Presidential Rank awards and the NRC's highest award of Distinguished Service.

During his tenure as the director of the Office of Nuclear Regulatory Research, he managed about 200 scientific and engineering staff as well as a budget of about 100 million dollars. Recognizing the importance of international cooperation and the importance of effective use of resources, he expanded bilateral and multilateral nuclear safety cooperation agreements with twenty seven countries.

Mr. Thadani was a member of the International Nuclear Safety Advisory Group tasked to give advice to the Director General of the International Atomic Energy Agency, member of the OECD Committees on Nuclear Regulatory Activities and Safety of Nuclear Installations, and he was chairman of the Committee on Safety of Nuclear Installations for five years. He also served on the Nuclear Energy Research Advisory Committee tasked to advise the Secretary of Energy.

**International harmonization of nuclear power safety...
Role of safety goals**

Civilian use of nuclear power requires a long term (100 years or more) commitment. This commitment must reflect an attitude of continuous close attention to world wide experience and results from nuclear safety research. Further, the nuclear map is changing as new countries access nuclear power and many new designs of power plants have been developed and yet others are under development. In recent years increased international partnerships have been developed to address issues of significant safety in designs and operation. However, there is a need for greater clarity in the expectations of the overall level of safety of designs. IAEA has made strides in proposing requirements for design of nuclear power plants but some gaps remain regarding high level safety goals (integration of deterministic and probabilistic elements) and agreement on such goals would lead to much harmonized safety requirements.

Wednesday, 27 June 2012

09:30 – 10:00

Coffee break

16AS-We2 Fukushima accident 2

Europa

10:00 – 11:40

Chair: Steve Epstein (UNITED STATES)

PRA NPP

Consequences of the Fukushima accident Cazzoli, Ericco (SLOVAKIA)	16AS-We2-1
Fundamental considerations of evacuation behavior of Fukushima residents in nuclear emergency event based on questionnaire surveys Nishino, Tomoaki (JAPAN)	16AS-We2-2
Tsunami PRA Standard Development by Atomic Energy Society Japan (AESJ) (1) Outline of Tsunami PRA and Plant Systems Analysis Kirimoto, Yukihiro (JAPAN)	16AS-We2-3
An Impact-based Approach in Selecting External Events for PRA at a NPP Narumiya, Yoshiyuki (JAPAN)	16AS-We2-4

16BS-We2 Very long term storage of radioactive waste 1

Fennia 2

10:00 – 11:40

Chair: Tito Bonano (UNITED STATES)

PRA NPP

Long-term Containment Performance Test of Metal Cask for Spent Nuclear Fuel Storage Wataru, Masumi (JAPAN)	16BS-We2-1
Seal and Closure Performance in Long Term Storage Völzke, Holger (GERMANY)	16BS-We2-2
SCC Evaluation Method of Multi-Purpose Canister in Long Term Storage Shirai, Koji (JAPAN)	16BS-We2-3
Studies on nuclear fuel evolution during storage and testing of used fuel response to impact loadings Rondinella, Vincenzo (GERMANY)	16BS-We2-4

27-We2 Risk and safety behavior

Fennia 1

10:00 – 11:40

Chair: Teemu Reiman (FINLAND)

Human org

Skills and traits as contributors to senior managerial safety commitment Fruhen, Laura (UNITED KINGDOM)	27-We2-1
A Behavior-Based Observation Program's Contribution to a Nuclear Facility Operational Safety Cournoyer, Michael (UNITED STATES)	27-We2-2
Risk acceptance: Perspectives of a challenging Matilde, Rodrigues (PORTUGAL)	27-We2-3
Behavioral Safety: a way to decrease injuries at work (with science) Sala Cattaneo, Carlo (ITALY)	27-We2-4
Designing the training: Leadership in Everyday Activities that hold Major Incident Risk von Hirsch Eriksen, Helen (NORWAY)	27-We2-5
A tool-supported training framework for improving operators' dependability confronted with faults and errors Barboni, Eric (FRANCE) >>> Moved from session 27-Mo2	27-Mo2-4

11:40 – 13:10

Lunch break

23-We2	Offshore risk management		
Nordia			
10:00 – 11:40	Chair: Jan Erik Vinnem (NORWAY)		Offshore
A Review and Discussion of the Norwegian Offshore Safety Regulation Regime for Risk Assessments Khorsandi, Jahon (NORWAY)			23-We2-1
A generic method for identifying major accident risk indicators Haugen, Stein (NORWAY)			23-We2-2
Incident data from decommissioning and removal of offshore installations Haugen, Stein (NORWAY)			23-We2-3
On the use of Vision Zero for production loss in the oil and gas industry Selvik, Jon Tømmerås (NORWAY)			23-We2-4

01-We2	Overview, discussions and new approaches		
Nautica			
10:00 – 11:40	Chair: Mitra Fouladirad (FRANCE)		Maintenance
Maintenance Optimisation and the ALARP Principle – Review and Discussion Flage, Roger (NORWAY)			01-We2-1
Maintenance Performance Indicators for TSOs Matahri, Naoelle (FRANCE)			01-We2-2
Economical effectiveness of Delay Time approach using in Time-Based maintenance modelling Werbinska-Wojciechowska, Sylwia (POLAND)			01-We2-3
Integration of root cause analysis and theory of inventive problem solving Viveros, Pablo (CHILE)			01-We2-4
A study of the efficacy of the inspection of railway rolling stock Cavalcante, Cristiano (UNITED KINGDOM) >>> Moved to session 01S-Mo3			01-We2-5

02-We2	Dynamic analysis		
Press Room			
10:00 – 11:40	Chair: Pierre-Etienne Labeau (BELGIUM)		Mathematics
Dynamic Probabilistic Risk Analysis of the Fast Cascade Phase of Large Disturbances in Power System Faghihi, Farshid (BELGIUM)			02-We2-1
Implementing dynamic flowgraph methodology models with logic programs Karanta, Ilkka (FINLAND)			02-We2-2
Applications of the Dynamic Flowgraph Methodology to Dynamic Modeling and Analysis Guarro, Sergio (UNITED STATES)			02-We2-3
Dynamic aspects and behaviors in performance and reliability assessment Distefano, Salvatore (ITALY)			02-We2-4
Building Dynamic Resilience Estimation Metrics for Interdependent Infrastructures Barker, Kash (UNITED STATES)			02-We2-5
Sequential optimization of oil production from multiple reservoirs under uncertainty Huseby, Arne (NORWAY)			02-We2-6
Calculation of damage frequencies without success criteria hypothesis. Application to MBLOCA sequences Salazar, Cesar Queral (SPAIN) >>> Moved from session 16A-Mo5			16A-Mo5-3

22-We2	External hazards 1	
Baltica		
10:00 – 11:40	Chair: Elisabeth Pate-Cornel (UNITED STATES)	External

Reassessment of external events in view of the Fukushima accident Olofsson, Frida (SWEDEN)	22-We2-1
Effect of severe space weather on cascading power grid failure: An illustrative model and policy implications Paté-Cornell, M. Elisabeth (UNITED STATES)	22-We2-2
Probabilistic hurricane rain model for the evaluation of mid/high-rise buildings damage due to water penetration Pinelli, Jean-Paul (UNITED STATES)	22-We2-3
Reliability analysis of a fish diversion structure at the cooling water intake of a power generating station Jyrkama, Mikko (CANADA)	22-We2-4
A risk framework for offshore wind farms in hazard-prone areas Staid, Andrea (UNITED STATES)	22-We2-5

17S-We2	Severe accident management guidance	
Marine Room		
10:00 – 11:40	Chair: Cornelia Spitzer (GERMANY)	Risk manag

Designing societal safety – A study of the Swedish crisis management system Tehler, Henrik (SWEDEN)	17S-We2-1
Development of severe accident management for Paks NPP Techy, Zsolt (HUNGARY)	17S-We2-2
Accident management programs in the nuclear domain: Status and perspective in Germany Spitzer, Cornelia (GERMANY)	17S-We2-3
Considerations for Future Development of SAMG at Multiple-Unit Sites Dinnie, Keith (CANADA)	17S-We2-4
SAMG Development for German NPPs: Concept and Utilities Point of View Schubert, Bernd (GERMANY)	17S-We2-5

11:40 – 13:10 Lunch break

08-We2	Stochastic and numerical simulation for reliability and risk analysis	
Eliel (hotel)		
10:00 – 11:40	Chair: Nicolò Pedroni (ITALY)	Stochastic
Graphic representation alternative to conditional cobweb plots Cormenzana, José Luis (SPAIN)		08-We2-1
Simulation of autonomous energy supply systems considering data and model uncertainties Gabel, Dieter (GERMANY)		08-We2-2
All-Terminal Reliability Evaluation through a Monte Carlo simulation based on an MPI implementation Pascual, Silvia (SPAIN)		08-We2-3
Numerical simulation of non-Gaussian stochastic processes by amplitude modulation and phase reconstruction Jiang, Yu (CHINA)		08-We2-4

07-We2	DSS case studies	
Selim (hotel)		
10:00 – 11:40	Chair:	DSS
A multicriteria decision model to support building maintenance planning Cavalcante, Cristiano (BRAZIL)		07-We2-1
A DSS to support maintenance planning for an electrical power distribution company Almeida-Filho, Adiel (BRAZIL)		07-We2-2
Using SysML language for maintenance decision-making model development to support complex maintenance program quantification Ruin, Thomas (FRANCE)		07-We2-3
A DSS for multiple dimension risk evaluation of a gas pipeline Almeida, Adiel (BRAZIL)		07-We2-4

20-We2	Fires and explosions	
Kino K13		
10:00 – 11:40	Chair: Valerio Cozzani (ITALY)	Industrial
A preliminary analysis of the 1996 channel tunnel fire by applying a TFSMS model Santos-Reyes, Jaime (MEXICO)		20-We2-1
Specificities in the explosion risk assessment of gas/dust hybrid mixtures Dufaud, Olivier (FRANCE)		20-We2-2
Physical hazards comparison based on flammable gas release for two kinds of polystyrene foams Nakarai, Toyooki (JAPAN)		20-We2-3
Passive fire protection materials for process equipment: testing the properties and modeling the behavior for advanced performance analysis Cozzani, Valerio (ITALY)		20-We2-4
Risk assessment in pressure tests: a case study Borgia, Orlando (ITALY)		20-We2-5

Wednesday, 27 June 2012

16A-We3 New HRA methods 2

Europa

13:10 – 14:30 Chair: Gareth Parry (UNITED STATES)

PRA NPP

A Model-Based Human Reliability Analysis Methodology
Mosleh, Ali (UNITED STATES) 16A-We3-1

A Model-Based Approach to HRA: Qualitative Analysis Methodology
Oxstrand, Johanna (UNITED STATES) 16A-We3-2

George Apostolakis Fellowship Award Winner

A Model-Based Approach to HRA: Example Application and Quantitative Analysis
Groth, Katrina M. (UNITED STATES) 16A-We3-3

Towards an Improved HRA Method
Dang, Vinh (UNITED STATES) 16A-We3-4

MERMOS-A: A new method to analyze pre-initiator for specific HRA
Serdet, Emmanuel (FRANCE) 16A-We3-5

16BS-We3 Very long term storage of radioactive waste 2

Fennia 2

13:10 – 14:30 Chair: Ken Sorensen (UNITED STATES)

PRA NPP

Mechanical Behaviour of High Burn-Up SNF under Normal and Accident Transport Conditions – Present Approaches and Perspectives
Wille, Frank (GERMANY) 16BS-We3-1

U.S. Gap Analysis to Support Extended Storage of Used Nuclear Fuel
Hanson, Brady (UNITED STATES) 16BS-We3-2

International Perspectives on Technical Data Gaps Associated with Long Term Storage and Transportation of Used Nuclear Fuel
Sorenson, Ken (UNITED STATES) 16BS-We3-3

Impact of Fuel Failure on Criticality Safety of Used Nuclear Fuel
Wagner, John (UNITED STATES) 16BS-We3-4

27-We3 Safety culture in complex systems

Fennia 1

13:10 – 14:30 Chair: Barry Kirwan (UNITED KINGDOM)

Human org

The EUROCONTROL safety culture questionnaire: Lessons from Application
Kirwan, Barry (UNITED KINGDOM) 27-We3-1

HSE Implications of Industrial Networks
Hansson, Lisbeth (NORWAY) 27-We3-2

Enhancing Network Safety through Network Governance, Shared Understanding and Interfirm Heedfulness
Gotcheva, Nadezhda (FINLAND) 27-We3-3

14:30 – 15:00 Coffee break

02S-We3	Bayesian network applications 1	
Nordia		
13:10 – 14:30	Chair: Ali Mosleh (USA)	Mathematics

A Bayesian Belief Network Method of Sensor Placement Optimization for System Reliability Monitoring Pourali, Masoud (UNITED STATES)	02S-We3-1
Assessment of causes of a bridge downfall using Bayesian network Holicky, Milan (CZECH REPUBLIC)	02S-We3-2
Developing a tool for rapid source term prediction (RASTEP) Swaling, Vidar H. (SWEDEN)	02S-We3-3
Root Cause Analysis to Identify Physical Causes Ruin, Thomas (FRANCE)	02S-We3-4
Bayesian Belief Networks for Predicting Drinking Water Distribution System Pipe Breaks Francis, Royce (UNITED STATES)	02S-We3-5

01-We3	Modeling tools and software for maintenance analyses	
Nautica		
13:10 – 14:30	Chair: Darren Prescott (UNITED KINGDOM)	Maintenance

Finding the optimal power plant maintenance strategy with fuzzy input data Aha, Ulrich (GERMANY)	01-We3-1
A probabilistic approach to introduce risk measurement indicators to an offshore wind project evaluation – improvement to an existing tool ECUME Douard, Fanny (FRANCE)	01-We3-3
Simulation Tool Development to Support Customer-Supplier Relationship for CBM Services Salokangas, Riku (ITALY)	01-We3-4

20-We3	RAMS 1	
Press Room		
13:10 – 14:30	Chair: Jørn Vatn (NORWAY)	Industrial

Experiences of using RAMS principles in rail transport, oil & gas, nuclear power and process industries – Conformities and differences Olsson, Anders (SWEDEN)	20-We3-1
Modelling the Availability of Offshore Wind Farm Sub-Assemblies Zitrou, Athena (UNITED KINGDOM)	20-We3-2
Availability analysis of chemical process plants with storage units applying Semi-Markov processes with semi-regenerative states Fink, Olga (SWITZERLAND)	20-We3-3
A model for the estimation of the impacts of system availability on cumulative oil production and economic return de Carvalho, Marcos Henrique (BRAZIL)	20-We3-5
Production availability analysis for oil and gas facilities: Concepts and procedure Brissaud, Florent (FRANCE)	20-We3-4

22-We3	Seismic risk – applications	
Baltica		
13:10 – 14:30	Chair:	External

Issues in Quantitative Seismic Risk Analysis of Petrochemical and Chemical Facilities Lin, James (UNITED STATES)	22-We3-1
Impact Evaluation of Updated Canadian Seismic Hazards on Point Lepreau G.S. PSA-Based Seismic Margin Assessment and Design Basis Mullin, Derek (CANADA)	22-We3-2
Estimation of seismic risk for Point Lepreau generating station utilizing simplified hybrid model Mullin, Derek (CANADA)	22-We3-4
The update of seismic probabilistic risk analysis for Loviisa nuclear power plant Helander, Juho (FINLAND)	22-We3-5

26-We3	SIL specific issues	
Marine Room		
13:10 – 14:30	Chair: Henrik Kortner (NORWAY)	SIL

Average probability of a dangerous failure on demand: Different modelling methods, similar results Brissaud, Florent (FRANCE)	26-We3-3
The application of Scrum to IEC 61508 certifiable software Stålhane, Tor (NORWAY)	26-We3-1
Impact of Wireless Signal Transmission on Analysis of SIL Compliance Dahl-Olsen, Håkon (NORWAY)	26-We3-2

Wednesday, 27 June 2012

14:30 – 15:00	Coffee break
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10-We3	I&C reliability models 1	
Eliei (hotel)		
13:10 – 14:30	Chair: Celine Martinie (FRANCE)	Software
Digital I&C Replacement Integration Method and Critical Digital Review Procedure Huang, Hui-Wen (TAIWAN)		10-We3-1
Modular fault tree modeling for digital I&C systems implemented with TXS, using the example of the NVNPP-2 reactor protection system Otto, Peter (GERMANY)		10-We3-2
A Diversity Model for Multi-Version Safety-Critical I&C Systems Vilkomir, Sergiy (UNITED STATES)		10-We3-3
Isolation of I&C model from PRA fault tree model Niemelä, Ilkka (FINLAND)		10-We3-4

21-We3	Critical issues in aviation – safety performance 1	
Selim (hotel)		
13:10 – 14:30	Chair: Carlo Cacciabue (ITALY)	Aviation
Risk management in the course of aircraft flight test planning and the flight test programme optimization Wójcik, Joanna (POLAND)		21-We3-1
The challenges in defining aviation safety performance indicators Klompstra, Margriet (NETHERLANDS)		21-We3-2
Software contributions to aircraft accidents and incidents: Recent case studies, analysis, and recommendations Jackson, David (UNITED STATES)		21-We3-3
A scenario based model for assessing runway conditions using weather data Huseby, Arne Bang (NORWAY)		21-We3-4
Integrating fatigue risk management into an airline's safety management system Koornneef, Floor (NETHERLANDS)		21-We3-5

09-We3	Structural reliability and degradation modeling 3	
Kino K13		
13:10 – 14:30	Chair: Kaisa Simola (FINLAND)	Structural
Probabilistic corrosion hazard assessment for partially surveyed pipelines Vaccaro, Filippo (ITALY)		09-We3-1
The Reliability Estimation Of Structural Components With Some Selected Failure Model Zieja, Mariusz (POLAND)		09-We3-2
A Probabilistic-Mechanistic Approach to Modeling Stress Corrosion Cracking Propagation in Alloy 600 Components with Applications Wu, Gary (UNITED STATES)		09-We3-3
Physics-based multi-state models of passive component degradation for the R7 reactor simulation environment Unwin, Stephen (UNITED STATES)		09-We3-4

16A-We4 Shut down and spent fuel analyses

Europaea

15:00 – 16:40 Chair: Risto Himanen (FINLAND)

PRA NPP

Development of a spent fuel pool level 1 PSA model for the French EPR reactor (FA3) Leloutre, Helene (FRANCE)	16A-We4-1
The probability based risk analysis of a planned shutdown and start-up for OL1 and OL2 nuclear power plants Tuulensuu, Hannu (FINLAND)	16A-We4-2
Deterministic Analyses of Severe Accidents inside Spent Fuel Pools for Support of PSA Level 2 Studies Steinrötter, Thomas (GERMANY)	16A-We4-3
Experience from PSA evaluations of a specific cold shutdown period Cederhorn, Erik (SWEDEN)	16A-We4-4
An Optimum Structure for Shut-Down PSA Becker, Günter (GERMANY)	16A-We4-5
Assessment of the Likelihood of Shipping a Spent Fuel Cask Susceptible to Criticality Dykes, Andrew A. (UNITED STATES)	16A-We4-6

16B-We4 Advances in fault tree and event tree methods

Fennia 2

15:00 – 16:40 Chair: Jari Pesonen (FINLAND)

PRA NPP

A Treatment of Not Logic in Fault Tree and Event Tree Analysis Krcal, Pavel (SWEDEN)	16B-We4-1
Anatomy of an Efficient Fault Tree Assessment Engine Rauzy, Antoine (FRANCE)	16B-We4-2
Systematic extraction of Minimal Cut Sequences from a BDMP model Chaux, Pierre-Yves (FRANCE)	16B-We4-3
Accurate quantification of event tree/fault tree systems using minimal cut sets Niemelä, Ilkka (FINLAND)	16B-We4-4
Fault Tree Linking versus Event Tree Linking Approaches: A Mathematical and Algorithmic Reconciliation Nusbaumer, Olivier (SWITZERLAND)	16B-We4-5

27-We4 Safety culture and indicators

Fennia 1

15:00 – 16:40 Chair: Teemu Reiman (FINLAND)

Human org

Hard data on soft subjects: The relationship between safety culture and nuclear power plant performance Koves, G. Kenneth (UNITED STATES)	27-We4-1
Toward universal process safety management attributes/categories for activities and outcomes observations Gerbec, Marko (SLOVENIA)	27-We4-2
Reliability Diagnostic Assessment (RDA) by using adapted International Sustainability Rating System – ISRSTM Alvarenga, Tobias Vieira (BRAZIL)	27-We4-3
Safety performance indicators as a tool for monitoring the industrial risk on conventional power plants Maia, Paulo (PORTUGAL)	27-We4-4

19:00

Bus transfers to Hilton Kalastajatorppa for the conference dinner

02AS-We4**Bayesian network applications 2****Nordia****15:00 – 16:40**

Chair: Ben Ale (NETHERLANDS)

Mathematics

Using Dynamic Bayesian Networks to Implement Feedback in a Management Risk Model for the Oil Industry Hanea, Daniela (NETHERLANDS)	02AS-We4-1
Hybrid Bayesian Networks for Weigh-in-Motion Systems Data Morales-Napoles, Oswaldo (NETHERLANDS)	02AS-We4-2
Representing Advanced Aspects of Fault Trees into Bayesian Networks – Modelling Safety in Complex Railway Systems Mahboob, Qamar (GERMANY)	02AS-We4-3
Integrating organisational factors into a BBN model of risk Lin, Pei-Hui (NETHERLANDS)	02AS-We4-4
Dynamic Bayesian Networks as a Possible Alternative to the Ensemble Kalman Filter for Parameter Estimation in Reservoir Engineering Hanea, Anca (NETHERLANDS)	02AS-We4-5

01-We4**Predictive maintenance****Nautica****15:00 – 16:40**

Chair: Antoine Grall (FRANCE)

Maintenance

A predictive maintenance strategy based on mean residual life for systems subject to competing failures due to degradation and shocks Castro, Inma T. (SPAIN)	01-We4-1
A Cost Model for the Selection of a Predictive Maintenance Activity in a Series System Curcurù, Giuseppe (ITALY)	01-We4-2
Predictive maintenance for the heated hold-up tank de Saporta, Benoîte (FRANCE)	01-We4-3
Analysis of the residual lifetimes of a system under deferred maintenance policy Sidibe, Ibrahima dit Bouran (FRANCE)	01-We4-4
Residual useful lifetime prognosis and design of control systems Langeron, Yves (FRANCE)	01-We4-5

02B-We4**Reliability analysis****Press Room****15:00 – 16:40**

Chair: John Andrews (UNITED KINGDOM)

Mathematics

Reliability assessment of safe egress in case of a fire incident using Adaptive Importance Sampling Siemon, Matthias (GERMANY)	02B-We4-1
α -Decomposition Method: A New Approach to the Analysis of Common Cause Failure Zheng, Xiaoyu (JAPAN)	02B-We4-2
Qualitative Analysis of Power Transformer Reliability by Fault Tree Sihite, Josep Franklin (JAPAN)	02B-We4-3
On the Usage of Reliability Methods in Early Design Phases Johansson, Cristina (SWEDEN)	02B-We4-4
Towards safe and reliable allocation of functions in modular process plants Krause, Annett (GERMANY)	02B-We4-5

22-We4	Seismic risk – methodology	
Baltica		
15:00 – 16:40	Chair: Stephan Kranz (GERMANY)	External
Development of Simplified Probabilistic Risk Assessment Model for Seismic Initiating Event Khericha, Soli (UNITED STATES)		22-We4-1
A system-of-systems framework of Nuclear Power Plant Probabilistic Seismic Hazard Analysis by Fault Tree analysis and Monte Carlo simulation Ferrario, Elisa (FRANCE)		22-We4-2
Development of importance measures for system fragility for the evaluation of seismic safety of NPP. Zentner, Irmela (FRANCE)		22-We4-3
Seismic Analysis using RiskSpectrum Bäckström, Ola (SWEDEN)		22-We4-4
Performance of Seismic PSA according to the German PSA Guideline Sewell, Robert T. (GERMANY)		22-We4-5

12-We4	Risk perception and communication	
Marine Room		
15:00 – 16:40	Chair: Joan Harvey (UNITED KINGDOM)	Risk perc
Risk Communication Within a Risk-Informed Regulatory Decision-Making Environment Coyne, Kevin (UNITED STATES)		12-We4-1
When might deception be acceptable, and what are the consequences for risk communication of deception being discovered? Harvey, Joan (UNITED KINGDOM)		12-We4-2
Participant Observation in Risk Problems Kluin, Marieke (NETHERLANDS)		12-We4-3
The role of feedback devices in changing driver behaviour and reducing insurance premia Harvey, Joan (UNITED KINGDOM)		12-We4-4
Low probability high cost: the example of the impact of nuclear accident on tourism Pascucci-Cahen, Ludivine (FRANCE)		12-We4-5

Wednesday, 27 June 2012

19:00 Bus transfers to Hilton Kalastajatorppa for the conference dinner

28-We4	Railway safety	
Eliei (hotel)		
15:00 – 16:40	Chair: Valerio Cozzani (ITALY)	Transport

Certification plan for development of safety products Myklebust, Thor (NORWAY)	28-We4-1
Measuring Safety Performance, the trialling of new guidance in Great Britain's rail industry Heavisides, Jay (UNITED KINGDOM)	28-We4-2
Holistic long-term optimization of maintenance strategies on ballasted railway track Quiroga, Lisandro Mariano (GERMANY)	28-We4-3
Conceptual Design of a Simulation System for Analyzing RAM of Railway Systems Kim, Jong-Woon (KOREA (REP.))	28-We4-4
Ballasted track – slab track: complementarity instead of opposition Antoni, Marc (FRANCE)	28-We4-5
Planning on Track – Introduction of a Planning Device in the Railway Domain Marcus, Arenius (GERMANY)	28-We4-6

21-We4	Aviation safety management	
Selim (hotel)		
15:00 – 16:40	Chair: Carlo Cacciabue (ITALY)	Aviation

Measuring team quality as a means for improving productivity in Air Traffic Management (ATM) Hansson, Lisbeth (NORWAY)	21-We4-1
Safety Scanning – An approach to manage safety in the Single European Sky Straeter, Oliver (GERMANY)	21-We4-2

George Apostolakis Fellowship Award Winner

A Review of System Safety Failure Probability Objectives for Unmanned Aircraft Systems Clothier, Reece (AUSTRALIA)	21-We4-3
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24S-We4	Vulnerability of critical infrastructures 1	
Kino K13		
15:00 – 16:00	Chair: Wolfgang Kröger	Infra

An adaptive simulation technique for efficient seismic risk assessment of critical infrastructures. Rasulo, Alessandro (ITALY)	24S-We4-1
Development of indicators to monitor vulnerabilities in power systems Hofmann, Matthias (NORWAY)	24S-We4-2
A Multi-Objective Memetic Optimization Method for Power Network Cascading Failures Protection Li, Yanfu (FRANCE)	24S-We4-3

24S-Th5	Vulnerability of critical infrastructures 2	
Selim (hotel)	This session has been moved from Thursday: 24-Th5	
16:00 – 17:00	Chair: Wolfgang Kröger	Infra

Intervention strategies for interdependent fragility control on urban lifelines systems Gomez, Camilo (UNITED STATES)	24-Th5-1
Resilience analysis of networked systems-of-systems based on structural and dynamic interdependencies Filippini, Roberto (ITALY)	24-Th5-2
Assessing CI interdependency issues using an HLA-compliant simulation platform Nan, Cen (SWITZERLAND)	24-Th5-3

Program Outline – Thursday, 28 June 2012

Europa	Fennia 2	Fennia 1	Nordia	Nautica	Press room
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08:30-09:30 Plenary session Th1
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Plenary
PL-Th1

09:30-10:00 10:00-11:40 Parallel sessions Th2

COFFEE BREAK					
PRA NPP	MAINTENANCE	HUMAN ORG	MATHEMATICS	INDUSTRIAL	SOFTWARE
16AS-Th2	01S-Th2	27-Th2	02-Th2	20-Th2	10-Th2
Fukushima accident 3	System health monitoring, fault diagnosis and prognosis	Organizational factors and safety	Markovian models	Learning from incidents	Software reliability assessment 1

11:40-13:10 13:10-14:30 Parallel sessions Th3

LUNCH BREAK					
PRA NPP	PRA NPP	HUMAN ORG	MATHEMATICS	INDUSTRIAL	SOFTWARE
16A-Th3	16B-Th3	27-Th3	02-Th3	20-Th3	10-Th3
Risk monitors	Comparison of HRA methods	Safety culture	Stochastic modeling in reliability	Risk assessment applications 1	Software reliability assessment 2

14:30-15:00 15:00-16:20 Parallel sessions Th4

COFFEE BREAK					
PRA NPP	PRA NPP	HUMAN ORG	MATHEMATICS	INDUSTRIAL	SOFTWARE
16A-Th4	16B-Th4	27-Th4	02-Th4	20-Th4	10-Th4
RI maintenance, testing and technical specifications	HRA applications 1	Key issues in safety management	Risk analysis	Risk assessment applications 2	Failure modes identification and classification

16:20-16:40 16:40-17:40 Parallel sessions Th5

FRUIT BREAK					
PRA NPP	PRA NPP	TRANSPORT	MATHEMATICS	INDUSTRIAL	SOFTWARE
16A-Th5	16B-Th5	28-Th5	02-Th5	20-Th5	10-Th5
PRA case studies	HRA applications 2	Modeling and applications - transportation	Probabilistic and statistical modeling and analysis	Industrial analysis approaches and cases 2	I&C reliability models 2

19:30-21:00

Helsinki City Reception at Helsinki City Hall

Baltica	Marine room	Eliei (hotel)	Selim (hotel)	Kino K13
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08:30-09:30
Plenary session
Th1

COFFEE BREAK

EXTERNAL	AVIATION
22-Th2	21-Th2
External hazards 2	Aerospace safety management

NON-PROB	PRA NPP
13-Th2	16B-Th2
Expert judgments	Fire methods and applications 1

09:30-10:00
10:00-11:40
Parallel sessions
Th2

LUNCH BREAK

PRA NPP	RISK PERC
16C-Th3	12-Th3
Other reactor types	Risk assessment - fundamental issues

ECONOMIC	PRA NPP
19-Th3	16D-Th3
Economic and financial issues	Fire methods and applications 2

11:40-13:10
13:10-14:30
Parallel sessions
Th3

COFFEE BREAK

HEALTH	AVIATION
25-Th4	21-Th4
Health care 1	Critical issues in aviation - safety performance 2

IMPORTANCE	PRA NPP
30-Th4	16C-Th4
Importance measures	Fire methods and applications 3

14:30-15:00
15:00-16:20
Parallel sessions
Th4

FRUIT BREAK

EXTERNAL	CRISIS	MAINTENANCE	INFRA	PRA NPP
22-Th5	31-Th5	01-Th5	24S-Th5	16C-Th5
Environmental impact assessments	Vulnerability and resilience analysis	Advances in maintenance modeling 2	Vulnerability of critical infrastructures 2	Data collection and analysis for fire PRA

16:20-16:40
16:40-17:40
Parallel sessions
Th5

Session moved to

24S-We5

19:30-21:00

PL-Th1

Europa

08:30 – 09:30

Plenary session: Jan Erik Vinnem (NORWAY)

Chair: Michael Knochenhauer (SWEDEN)

Plenary



Jan Erik Vinnem, adjunct professor of risk management at the University of Stavanger. He has played a central role regarding the use of risk analysis in the Norwegian offshore industry since the late 1970ties, and has also written the book *Offshore Risk Assessment*. In 1984 he started the consulting firm Safetec Nordic AS, where he recently was Chairman of the board in the period 2006-08.

Vinnem has also been an adjunct professor of marine safety at NTNU, and has had a number of positions both nationally and internationally, including vice chairmanship in ESRA International some fifteen years ago. Vinnem has also founded and currently runs the consultancy Preventor AS.

Reflections on the Gulf of Mexico disaster and other serious events in the offshore oil and gas sector from a risk assessment and risk management perspective

A brief historical overview is presented of the development of risk assessment and risk management in the offshore oil and gas industry for more than 35 years. From a modest start as a research activity inspired by the nuclear sector, Quantified Risk Assessment has today become one of the focal points of oil and gas management in all countries around the North Sea, and also in many other areas. This has mainly been initiated by authority regulations and requirements, but has now for some time been driven by the industry itself, as it sees the risk assessment techniques as a vehicle to gain extended flexibility with respect to optimization of offshore safety standards. The main efforts are made with respect to prevention and mitigation of major hazards, which also is the main topic of the presentation. Despite these efforts there have been more major accidents worldwide in the last 10–15 years than in any previous period. Following the recent accidents, it has been suggested by some that more countries should adopt a risk based (or better; risk informed) approach to management of major hazard risk in their regulations.

The paper discusses how QRAs are used in the offshore oil and gas sector in UK and Norway, and makes a brief comparison with the use of corresponding approaches in the nuclear power industry. Although the origin is the same, the applications have developed in virtually opposite directions. The main weakness with current applications is the inability of the QRA studies for the offshore oil and gas sector to address aspects that are essential in an operational context. This implies that there are extensive decision-making activities in the operational phase, including management of the drilling operations of new wells that are made without systematic and detailed consideration of major hazard aspects. This is discussed in detail, and the implications for risk management in relation to the Macondo accident in the Gulf of Mexico and others are reflected upon. Possibilities for improvement are outlined, with a side glance to approaches adopted in the nuclear power industry.

Thursday, 28 June 2012

09:30 – 10:00

Coffee break

16AS-Th2	Fukushima accident 3	
Europaea		
10:00 – 11:40	Chair:	PRA NPP

Risk Targets in View of Fukushima Vitazkova, Jirina (SLOVAKIA)	16AS-Th2-1
Post-Fukushima PSA Development for New Reactors in Russia Tokmachev, Gennady (RUSSIAN FEDERATION)	16AS-Th2-2
Accident Progression of Severe Accident in Various Nuclear Reactor Types Park, Sooyong (KOREA (REP.))	16AS-Th2-3
Tsunami PRA Standard Development by Atomic Energy Society Japan (AESJ) Line break (3) Tsunami Fragility Analysis Mihara, Yoshinori (JAPAN)	16AS-Th2-4
Tsunami PRA Standard Development by Atomic Energy Society Japan (AESJ) (4) Unresolved Issues and Future Works Yamaguchi, Akira (JAPAN)	16AS-Th2-5

01S-Th2	System health monitoring, fault diagnosis and prognosis	
Fennia 2		
10:00 – 11:40	Chair: Piero Baraldi (ITALY)	Maintenance

Health Assessment of Choke Valves undergoing Erosion with a Hybrid Ensemble Approach Gola, Giulio (NORWAY)	01S-Th2-1
Diagnosis of Transient States Using Pattern Matching Techniques for Improved Operability Heo, Gyunyoung (KOREA (REP.))	01S-Th2-2
A Maturation Procedure For Prognosis And Health Monitoring Algorithms Hmad, Ouadie (FRANCE)	01S-Th2-3
Prognostic maintenance policy based on remaining useful life estimation Le Son, Khanh (FRANCE)	01S-Th2-4
A Wavelet-Based Approach for Condition Monitoring of a Gas Turbine During Start-Up Transients Di Maio, Francesco (ITALY)	01S-Th2-5
Ensemble of Neural Networks for Predicting Scale Deposition in Oil Well Plant Equipments Di Maio, Francesco (ITALY)	01S-Th2-6

27-Th2	Organisational factors and safety	
Fennia 1		
10:00 – 11:40	Chair:	Human org

Modelling human and organizational behaviour in a high-risk operation Sillem, Simone (NETHERLANDS)	27-Th2-1
A comparison between the nuclear and the maritime domains on challenges related to technological advances Ferkingstad, John (NORWAY)	27-Th2-2
Ship-platform collisions in the North Sea Oltedal, Helle (NORWAY)	27-Th2-3
Alienation and seamanship: A field study on an offshore service vessel Sydnes, Tone (NORWAY)	27-Th2-4
A qualitative study of organizational factors influencing compliance with procedures. Skaugrud, Ida (NORWAY)	27-Th2-5

11:40 – 13:10	Lunch break
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02-Th2	Markovian models	
Nordia		
10:00 – 11:40	Chair:	Mathematics

Statistical inference of a discrete-time Markovian degradation model with time-dependent covariates Paroissin, Christian (FRANCE)	02-Th2-1
Reliability assessment of safety-instrumented systems: The influence of demand rates and demand durations Liu, Yiliu (NORWAY)	02-Th2-2
Dynamic reliability upper bounds on customer-centered performance measures for multi-state systems with multi-state components Solorio Magaña, Carlos (MEXICO)	02-Th2-3
Critical comparison of two user friendly tools to study Piecewise Deterministic Markov Processes (PDMP) Bouissou, Marc (FRANCE)	02-Th2-4
Analysis of the reliability discrepancy in container transshipment system Zajac, Mateusz (POLAND)	02-Th2-5

20-Th2	Learning from incidents	
Nautica		
10:00 – 11:40	Chair: Stig O. Johnsen (NORWAY)	Industrial

From factor to vector, a systems engineering design perspective on safety Stoop, John (NETHERLANDS)	20-Th2-1
Managing the risks associated with a simple operation in a complex system Jubert, Fabrice (FRANCE)	20-Th2-2
Accident Precursors: Critical Review, Conceptual Framework, and Failure Mechanisms Saltmarsh, Elizabeth A. (UNITED STATES)	20-Th2-3
Safety and security challenges of integration of process control systems and information and communication technology Johnsen, Stig Ole (NORWAY)	20-Th2-4
The use of a root cause analysis method for industrial plant reliability improvement and engineering design feedback Nascimento, Cesar (BRAZIL)	20-Th2-5
BP Texas City Refinery Explosion: Case study in breakdown of defense-in-depth and violation of the safety-diagnosability principle in design Haga, Rachel A. (UNITED STATES)	20-Th2-6

10-Th2	Software reliability assessment 1	
Press Room		
10:00 – 11:40	Chair: Jan-Erik Holmberg (FINLAND)	Software

An Integrated Quantification Method for Safety-Critical Software Failure Probability Kang, Hyun Gook (KOREA (REP.))	10-Th2-1
Safety case framework to provide justifiable reliability numbers for software systems Holmberg, Jan-Erik (FINLAND)	10-Th2-2
A component-based approach for assessing reliability of compound software Kristiansen, Monica Lind (NORWAY)	10-Th2-3
Use of IEC 61508 in Nuclear Applications Regarding Software Reliability Bäckström, Ola (SWEDEN)	10-Th2-4
Context-based Software Risk Modeling: A recommended approach to assessment of software related risk in NASA missions Guarro, Sergio (UNITED STATES)	10-Th2-5

22-Th2	External hazards 2	
Baltica		
10:00 – 11:40	Chair: Roshi Nateghi (UNITED STATES)	External
	Risk assessment of accidents induced by lightning strike on storage tanks Cozzani, Valerio (ITALY)	22-Th2-1
	Potential damage to filtration systems due to volcanic ash fallout Milazzo, Maria Francesca (ITALY)	22-Th2-2
	Vulnerability maps for industrial facilities in areas with the potential volcanic ash fallout Milazzo, Maria Francesca (ITALY)	22-Th2-3
	Frequency of damage by external explosion hazards based on geographical information Becker, Günter (GERMANY)	22-Th2-4
	Individual and social risk assessment for toxic gas outflow by road transport Saska, Tomas (CZECH REPUBLIC)	22-Th2-5

21-Th2	Aerospace safety management	
Marine Room		
10:00 – 11:40	Chair: Joseph Fragola (UNITED STATES)	Aviation
	Fault detection and fault tolerant control scheme for aerospace launcher Zbiri, Nabila (FRANCE)	21-Th2-1
	Risk assessment of new space launch and supply vehicles Guarro, Sergio (UNITED STATES)	21-Th2-2
	A "Systems/Case-based" approach to system safety Dezfuli, Homayoon (UNITED STATES)	21-Th2-3
	Evolution of continuous risk management at NASA Benjamin, Allan (UNITED STATES)	21-Th2-4
	Application of PRA to developmental systems Fragola, Joseph (UNITED STATES)	21-Th2-5

11:40 – 13:10	Lunch break
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13-Th2	Expert judgments	
Selim (hotel)		
10:00 – 11:40	Chair:	Non-prob
Evaluating the effect of confidence in assessment in a predictive process relying on expert judgement Tamparopoulos, Alexios E. (AUSTRIA)		13-Th2-1
The moment method for combining quantitative expert judgements Bedford, Tim (UNITED KINGDOM)		13-Th2-2

16B-Th2	Fire methods and applications 1	
Kino K13		
10:00 – 11:40	Chair: Lasse Tunturivuori (FINLAND)	PRA NPP
Fire PSA for French 1300 MWe PWR Nicoleau, Fabienne (FRANCE)		16B-Th2-1
Specific fire safety issues for first generation VVER-440 reactors Poghosyan, Shahen (ARMENIA)		16B-Th2-2
Modelling of the fire scenarios to the PSA Vidal, Serge (FRANCE)		16B-Th2-3
Probabilistic Fire Analyses for Spanish NPPs Carretero Fernandino, Jose Antonio (SPAIN)		16B-Th2-4
Treatment of Level 1 Fire Risk Evaluation in a US Nuclear Power Plant Wang, Jinkai (UNITED STATES)		16B-Th2-5

Thursday, 28 June 2012

16A-Th3	Risk monitors	
Europaea		
13:10 – 14:30	Chair: Dennis Henneke (UNITED STATES)	PRA NPP

Development and Validation of Instantaneous Risk Model in Nuclear Power Plant's Risk Monitor Wang, Jin (CHINA)	16A-Th3-1
Full scope risk monitor for the Slovak electrical power system Kovacs, Zoltan (SLOVAKIA)	16A-Th3-2
Development and Application of Risk Monitor in Dukovany NPP Hustak, Stanislav (CZECH REPUBLIC)	16A-Th3-3
Risk Monitor Development for the Paks NPP Karsa, Zoltan (HUNGARY)	16A-Th3-4
Development and Application of Third Qinshan Nuclear Power Plant Risk Monitor Wang, Fang (CHINA)	16A-Th3-5

16B-Th3	Comparison of HRA methods	
Fennia 2		
13:10 – 14:30	Chair: Helene Pesme (FRANCE)	PRA NPP

Comparing Various HRA Methods to Evaluate their Impact on the results of a Shutdown Risk Analysis during PWR Reduced Inventory Zoulis, Antonios (UNITED STATES)	16B-Th3-1
EXAM-HRA – Evaluation of Existing Applications and Guidance on Methods for HRA Fritzson, Lisa (SWEDEN)	16B-Th3-2
HRA Method Analysis Criteria Dang, Vinh (UNITED STATES)	16B-Th3-3
Spectrum Human Reliability Analysis Petkov, Gueorgui (BULGARIA)	16B-Th3-4
Fifty Years of THERP and Human Reliability Analysis Boring, Ronald (UNITED STATES)	16B-Th3-5

27-Th3	Safety culture	
Fennia 1		
13:10 – 14:30	Chair: Barry Kirwan (UNITED KINGDOM)	Human org

Formal Safety versus Real Safety: Quantitative and Qualitative Approaches to Safety Culture Meliá, José L. (SPAIN)	27-Th3-1
Learning across Europe - Insights from a Pan-European safety culture programme Kirwan, Barry (FRANCE)	27-Th3-2
Does the management of regulatory compliance and occupational risk have an impact on safety culture? Lefranc, Guénolé (FRANCE)	27-Th3-3
Detailed analysis of four categories of culture-driven organizational factors in the light of incident analysis Thunem, Atoosa P-J (NORWAY)	27-Th3-4

14:30 – 15:00	Coffee break
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02-Th3	Stochastic modeling in reliability		
Nordia			
13:10 – 14:30	Chair: Uwe Jensen (NORWAY)		Mathematics
	Reliability of the multi-state systems modeled by the finite states semi-Markov processes Grabski, Franciszek (POLAND)		02-Th3-1
	Extended geometric processes for application to reliability Mercier, Sophie (FRANCE)		02-Th3-2
	Generalized method for solving logical loops in reliability analysis Matsuoka, Takeshi (JAPAN)		02-Th3-3
	A shock and wear model standing a fixed number of shocks Pérez-Ocón, Rafael (SPAIN)		02-Th3-4
	Fault tree and Monte Carlo simulation in passive system reliability analysis Yu, Yu (CHINA) >>> Moved from session 16BS-Mo2		16BS-Mo2-4

20-Th3	Risk assessment applications 1		
Nautica			
13:10 – 14:30	Chair: Kurt Petersen (DENMARK)		Industrial
	Analysis and modeling of risk associated with the transport of hazardous materials in Walloon Region (Belgium) Beaudoingt, Damien (BELGIUM)		20-Th3-1
	Risk analysis of incident-accident transformation in air traffic Skorupski, Jacek (POLAND)		20-Th3-2
	The weighted risk analysis applied for the Delft Tunnel in the Netherlands Suddle, Shahid (NETHERLANDS)		20-Th3-3
	Route based risk estimation across the GB rail network using empirical Bayes methods Griffin, David (UNITED KINGDOM)		20-Th3-4

10-Th3	Software reliability assessment 2		
Press Room			
13:10 – 14:30	Chair: Celine Martinie (FRANCE)		Software
	Comparing safety requirement sources of machinery software Malm, Timo (FINLAND)		10-Th3-1
	Performance Estimation of a System under Minimal, Perfect and Failed Rejuvenation Koutras, Vasilis (GREECE)		10-Th3-2
	Assessment of bit error detecting and correcting codes for safety-critical embedded fuzing systems Häring, Ivo (GERMANY)		10-Th3-3
	Optimal Reliability Allocation for Large Software Projects through Soft Computing Techniques Albu, Razvan-Daniel (ROMANIA)		10-Th3-4

16C-Th3	Other reactor types	
Baltica		
13:10 – 14:30	Chair: Kaisa Simola (FINLAND)	PRA NPP

Outlines of RAMI Guidelines for DEMO Systems
Pinna, Tonio (ITALY) 16C-Th3-1

George Apostolakis Fellowship Award Winner		
Preliminary Results of the TerraPower – 1 Probabilistic Risk Assessment Johnson, Brian (UNITED STATES)		16C-Th3-2

12-Th3	Risk assessment – fundamental issues	
Marine Room		
13:10 – 14:30	Chair: Enrico Zio (ITALY)	Risk perc

Complexity in risk assessment of sociotechnical systems
Johansen, Inger Lise (NORWAY) 12-Th3-1

Development of training to improve PSA awareness of decision-makers in order to support the growing use of PSA
Vasseur, Dominique (FRANCE) 12-Th3-2

The Science and Superstition of Quantitative Risk Assessment
Rae, Andrew (UNITED KINGDOM) 12-Th3-3

A practical guide on how to present and visualize the result of risk and vulnerability analyses in a societal safety and security context
Amundrud, Øystein (NORWAY) 12-Th3-4

Thursday, 28 June 2012

14:30 – 15:00	Coffee break
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19-Th3	Economic and financial issues	
Selim (hotel)		
13:10 – 14:30	Chair: Ahti Salo (FINLAND)	Economic
Bankruptcy by catastrophes for major multi-nationals: stock exchange sensitivity for three catastrophes van Gulijk, Coen (NETHERLANDS)		19-Th3-1
On the use of Quality Function Deployment (QFD) for the identification of risks associated to warranty programs Costantino, Francesco (ITALY)		19-Th3-2
A “Triple Bottom Line” approach to QRA Cavanagh, Nicholas (UNITED KINGDOM)		19-Th3-3
Are too many safety measures crowding each other out? Moharamzadeh, Alireza (NORWAY)		19-Th3-4
The Customer Relationship in the Warranty Management of Distribution Network Service Providers Crespo, Adolfo (SPAIN)		19-Th3-5

16D-Th3	Fire methods and applications 2	
Kino K13		
13:10 – 14:30	Chair: Heinz-Peter Berg (GERMANY)	PRA NPP
Updating of the fire PRA of the Olkiluoto NPP units 1 and 2 Tunturivuori, Lasse (FINLAND)		16D-Th3-1
Analysis of Fire and Flooding at OKG: Method, Background and Application Bäckström, Ola (SWEDEN)		16D-Th3-2
Application of OECD FIRE Data for Plant Specific Fire Event Trees Roewekamp, Marina (GERMANY)		16D-Th3-3
Using NUREG/CR-6850 in a Full Scope Fire PSA: Implementation Strategies and Insights Gained Nusbaumer, Olivier (SWITZERLAND)		16D-Th3-4
Advanced Fire PRA Methods for Cabinet Fires and DC Circuit Hot Shorts Henneke, Dennis (UNITED STATES)		16D-Th3-5

16A-Th4	RI maintenance, testing and technical specifications	
Europaea		
15:00 – 16:20	Chair: Risto Himanen (FINLAND)	PRA NPP

Multi-objective optimization of safety equipment test interval using a new time-dependent unavailability model incorporating component ageing Kancev, Dusko (SLOVENIA)	16A-Th4-1
Risk-informed Periodic Surveillance Testing Interval of Digital Safety Systems with Self-diagnosis Capacity Shi, Jian Ming (CHINA)	16A-Th4-2
Evaluation of Allowed Outage Time (AOT) in Technical Specifications at Ringhals 1 Wallgren, Erik (SWEDEN)	16A-Th4-3
Risk-informed classification of equipment for maintenance Jänkälä, Kalle (FINLAND)	16A-Th4-4

16B-Th4	HRA applications 1	
Fennia 2		
15:00 – 16:20	Chair: Harold Blackman (UNITED STATES)	PRA NPP

ATHEANA analysis in support of the U.S. HRA empirical study Bley, Dennis (UNITED STATES)	16B-Th4-1
Towards guidance for assessment of "training" as a performance-shaping factor in human reliability analysis Bye, Andreas (NORWAY)	16B-Th4-2
Current human reliability analysis methods applied to computerized procedures Boring, Ronald (UNITED STATES)	16B-Th4-3
Haven't a cue? The CUE Map as an HRA aid in modeling hybrid and advanced HSI Gertman, David (UNITED STATES)	16B-Th4-4
A comparison of published human computer interaction reliability data with established HRA methods Hickling, Ned (UNITED KINGDOM)	16B-Th4-5

27-Th4	Key issues in safety management	
Fennia 1		
15:00 – 16:20	Chair: Björn Wahlström (FINLAND)	Human org

Professionals' beliefs about nuclear safety – An interview study in the Nordic nuclear branch Reiman, Teemu (FINLAND)	27-Th4-1
Identification and management of risks of system of systems Prochazkova, Dana (CZECH REPUBLIC)	27-Th4-2
Safety management – a multi-level control problem Wahlström, Björn (FINLAND)	27-Th4-3
Reconceptualization of the competing values framework tailored for management of nuclear power plants Reiman, Teemu (FINLAND)	27-Th4-4
Safety management for operational controllability: developing an organized theoretical perspective Moorkamp, Matthijs (NETHERLANDS)	27-Th4-5

16:20 – 16:40	Fruit break
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02-Th4	Risk analysis	
Nordia		
15:00 – 16:20	Chair: Willy Røed (NORWAY)	Mathematics
	Quantifying impact of project risk decisions and dependencies within an integrated methodology Smith, Clayton (UNITED STATES)	02-Th4-1
	A reflection on some practices in the use of risk matrices Røed, Willy (NORWAY)	02-Th4-2
	The use of field experience to assess the probabilities of major accidents Flauw, Yann (FRANCE)	02-Th4-3
	The quantitative risk assessment of domino effect on industrial plants using colored stochastic Petri nets Kadri, Farid (FRANCE)	02-Th4-4

20-Th4	Risk assessment applications 2	
Nautica		
15:00 – 16:20	Chair: Marco Cepin (SLOVENIA)	Industrial
	Integrating time determination with qualitative risk assessment method – Case study for road construction project in Malaysia Ting, Sim Nee (MALAYSIA)	20-Th4-1
	Risk and hazard analyses of the industrial furnaces – Safety of electroheat equipment Kotek, Lubos (CZECH REPUBLIC)	20-Th4-2
	Multidimensional risk assessment of manhole explosions in an underground electrical distribution system Garcez, Thalles Vitelli (BRAZIL)	20-Th4-3
	Applications of a comprehensive semi-quantitative risk assessment method for various industries Berg, Heinz Peter (GERMANY)	20-Th4-4

10-Th4	Failure modes identification and classification	
Press Room		
15:00 – 16:20	Chair: Jan-Erik Holmberg (FINLAND)	Software
	Development of best practice guidelines on failure modes taxonomy for reliability assessment of digital I&C systems for PSA Holmberg, Jan-Erik (FINLAND)	10-Th4-1
	Identification of failure modes of software in safety-critical digital I&C systems in nuclear power plants Smidts, Carol (KOREA (REP.))	10-Th4-2
	Proposal for the taxonomy of failure modes of digital system hardware for PSA Piljugin, Ewgenij (GERMANY)	10-Th4-3
	A comparison of taxonomies of digital system failure modes Chu, Tsong-Lun (UNITED STATES)	10-Th4-4

25-Th4	Health care 1	
Baltica		
15:00 – 16:20	Chair: Henning Boje Andersen (DENMARK)	Health

Root cause analysis in healthcare as a solution to patient safety – Reality or illusion? Wreathall, John (UNITED STATES)	25-Th4-1
The challenge of improving safety culture in hospitals: A longitudinal study using hospital survey on patient safety culture Olsen, Espen (NORWAY)	25-Th4-2
Nonparametric approach applied on medical survival data: Uncertainty analysis and comparison of two operative techniques Janurová, Kateřina (CZECH REPUBLIC)	25-Th4-3
A questionnaire-based survey on nurse perceptions of patient handoffs in Japanese hospitals Gu, Xiuzhu (JAPAN)	25-Th4-4
Studying quality and safety in hospitals by using different theoretical frameworks – does it matter? Wiig, Siri (NORWAY)	25-Th4-5

21-Th4	Critical issues in aviation – safety performance 2	
Marine Room		
15:00 – 16:20	Chair: Carlo Cacciabue (ITALY)	Aviation

Condition based maintenance: A methodology for the economical feasibility evaluation of prognostic health management integration Vallone, Giorgio (ITALY)	21-Th4-1
Comparing aircraft maintenance approaches based on structural health monitoring Gogu, Christian (FRANCE)	21-Th4-2
On helicopter transport risk for offshore petroleum personnel Heide, Bjornar (NORWAY)	21-Th4-3

George Apostolakis Fellowship Award Winner

The development of ground impact models for the analysis of the risks associated with unmanned aircraft operations over inhabited areas Clothier, Reece (AUSTRALIA)	21-Th4-4
Model-based design and evaluation of fault-tolerant fibre-optical networks for avionics Schulze, Karin (GERMANY)	21-Th4-5

16:20 – 16:40	Fruit break
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30-Th4	Importance measures	
Selim (hotel)		
15:00 – 16:20	Chair: Emanuele Borgonovo (ITALY)	Importance
Modelling common cause failures and computing risk importance measures in the Dynamic Flowgraph Methodology Tyrväinen, Tero (FINLAND)		30-Th4-1
Expected value of perfect information: estimation from given data and an application to a precursor event Borgonovo, Emanuele (ITALY)		30-Th4-2
Examination of the application of risk importance measures for the maintenance management at the Rokkasho Reprocessing Plant Tamauchi, Yoshikazu (JAPAN)		30-Th4-3
Reliability evaluation for compound systems with importance measures Si, Shubin (CHINA)		30-Th4-4
16C-Th4	Fire methods and applications 3	
Kino K13		
15:00 – 16:20	Chair: Marina Röwekamp (GERMANY)	PRA NPP
Lessons learned from risk-informed, performance-based fire protection (NFPA 805) regulatory reviews Harrison, Donald (UNITED STATES)		16C-Th4-1
NFPA-805 and fire PRA insights Chapman, James (UNITED STATES)		16C-Th4-2
Development of empirical fire behavior models for estimation of target damage in a fire PRA Ladd, Robert (UNITED STATES)		16C-Th4-3

16A-Th5	PRA case studies	
Europaea		
16:40 – 17:40	Chair: Kaisa Simola (FINLAND)	PRA NPP

A new perspective in nuclear power plant safety considering pumped-storage hydro plant Gjorgiev, Blaze (SLOVENIA)	16A-Th5-1
Safety and risk analysis of liquid radioactive waste transfer from Angra 1 to Angra 2 through a container tank Passos, Erivaldo P. (BRAZIL)	16A-Th5-2
Diesel generators common cause failures in precursor analysis. Methodological issues and application for the Generic Incident and 2 case studies. Rodionova, Natalia (FRANCE)	16A-Th5-3
Development of location dependent loss of coolant Accident frequencies to address debris-induced failures of core cooling systems Fleming, Karl (UNITED STATES)	16A-Th5-4

16B-Th5	HRA applications 2	
Fennia 2		
16:40 – 17:40	Chair: Dennis Bley (UNITED STATES)	PRA NPP

Progress on Errors of Commission: an outlook based on plant-specific results Podofilini, Luca (SWITZERLAND)	16B-Th5-1
Abandonment times evaluation of main control room at Daya Bay Nuclear Plant Huang, Qian (CHINA)	16B-Th5-2
Human reliability analyses performed in support of PSA studies in Czech Republic Holy, Jaroslav (CZECH REPUBLIC)	16B-Th5-3

28-Th5	Modeling and applications – transportation	
Fennia 1		
16:40 – 17:40	Chair: Valerio Cozzani (ITALY)	Transport

A Petri net-based approach for computing two-terminal reliability of a transportation network with multi-state nodes and arcs Zhang, Tao (CHINA) >>> <i>Moved to session 02-Mo2</i>	28-Th5-1
Maintenance process optimization for low-cost airlines Kowalski, Marcin (POLAND)	28-Th5-2
Risk management in a transport system – Identification of precursors of danger Cointet, Alain (FRANCE)	28-Th5-3
Simulation and multi-objective optimization of an open-pit mine truck-shovel system by the cross-entropy method Mena, Rodrigo (FRANCE)	28-Th5-4
Security of supply, case Finnish ports Yliskylä-Peuralahti, Johanna (FINLAND)	28-Th5-5

19:30 – 21:00	Helsinki City Reception at Helsinki City Hall
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02-Th5	Probabilistic and statistical modeling and analysis	
Nordia		
16:40 – 17:40	Chair: Kevin Wilson (UNITED KINGDOM)	Mathematics

Uncertainty assessment through bootstrapped support vector regression Lins, Isis (BRAZIL)	02-Th5-1
Assessment of national reference values for railway safety – A statistical treatment Schaebe, Hendrik (GERMANY)	02-Th5-2
Assessment of accident probability for the local areas: Copula – based model Krymsky, Victor (RUSSIAN FEDERATION)	02-Th5-3
Traffic load model based on weigh in motion measurements Steenbergen, Raphaël (NETHERLANDS)	02-Th5-4
Universal generating function based recursive algorithms for reliability evaluation of multi-state weighted k-out-of-n systems Ding, Yi (DENMARK)	02-Th5-5

20-Th5	Industrial analysis approaches and cases 2	
Nautica		
16:40 – 17:40	Chair: John Andrews (UNITED KINGDOM)	Industrial

Use-case of an agent-oriented framework for supervision, diagnosis and prognosis applications Thunem, Harald P.-J. (NORWAY)	20-Th5-1
A Petri net approach to fault verification in phased mission systems using the standard deviation technique Lloyd, Michael (UNITED KINGDOM)	20-Th5-2
The development of a fatigue and drowsiness predictor Shiomi, Kakuichi (JAPAN)	20-Th5-3

10-Th5	I&C reliability models 2	
Press Room		
16:40 – 17:40	Chair: Michael Knochenhauer (SWEDEN)	Software

A method for the assessment of common cause failures of digital I&C hardware Deleuze, Gilles (FRANCE)	10-Th5-1
Reliability analysis of digital I&C system in nuclear power plant using dynamic flowgraph methodology Zhao, Jun (CHINA)	10-Th5-2
Finding the best approach for I&C modeling in the PSA in the different design phases Brunelière, Hervé (FRANCE)	10-Th5-3

22-Th5	Environmental impact assessments	
Baltica		
16:40 – 17:40	Chair: Seth Guikema (UNITED STATES)	External

- Expert system for environmental impact assessment
Hamzi, Rachida (ALGERIA) 22-Th5-1
- Discussion of environmental risk assessment models for reactive systems (BLEVE)
Galante, Erick (BRAZIL) 22-Th5-2

31-Th5	Vulnerability and resilience analysis	
Marine Room		
16:40 – 17:40	Chair:	Crisis

- Comparing topological performance measures and physical flow models for vulnerability analysis of power systems
Johansson, Jonas (SWEDEN) 31-Th5-1
- Modelling and simulation of service system resilience
Kanno, Taro (JAPAN) 31-Th5-2
- Propelling beyond the Bow Tie: An emergent dynamic risk – resilience model
Van Trijp, John (NETHERLANDS) 31-Th5-3

01-Th5	Advances in maintenance modeling 2	
Eliel (hotel)		
16:40 – 17:40	Chair:	Maintenance
Development of an overall maintenance optimization framework for offshore wind turbine Hameed, Zafar (NORWAY)		01-Th5-1
Optimal routing, design and maintenance of main pipelines considering internal corrosion Marcoulaki, Eftychia (GREECE)		01-Th5-2
Tailored maintenance optimization within Maintenance on Demand project Lesobre, Romain (FRANCE)		01-Th5-3

24-Th5	Vulnerability of critical infrastructures 2	
Selim (hotel)	This session has been moved to Wednesday: 24-We5 (Hall Kino K13)	
16:40 – 17:40	Chair: Wolfgang Kröger (GERMANY)	Infra
Intervention strategies for interdependent fragility control on urban lifelines systems Gomez, Camilo (UNITED STATES)		24-Th5-1
Resilience analysis of networked systems-of-systems based on structural and dynamic interdependencies Filippini, Roberto (ITALY)		24-Th5-2
Assessing CI interdependency issues using an HLA-compliant simulation platform Nan, Cen (SWITZERLAND)		24-Th5-3

16C-Th5	Data collection and analysis for fire PRA	
Kino K13		
16:40 – 17:40	Chair: Albert Kreuser (GERMANY)	PRA NPP
Development of a fire PRA database system Dong Kyu, Kim (KOREA (REP.))		16C-Th5-1
Use of Excel VBA macros in FRANX input database creation McNeely, William (UNITED STATES)		16C-Th5-2
Updated technical reliability data for fire protection systems and components at a German nuclear power plant Roewekamp, Marina (GERMANY)		16C-Th5-3

Program Outline – Friday, 29 June 2012

	Europaea	Fennia 2	Fennia 1	Nordia	Nautica	Press room
08:30-09:30 Plenary session Fr1	Plenary PL-Fr1					
09:30-10:00	COFFEE BREAK					
10:00-11:40 Parallel sessions Fr2	PRA NPP 16AS-Fr2 Fukushima and stress tests	PRA NPP 16B-Fr2 HRA applications 3	PRA NPP 16C-Fr2 CCF and dependences	MATHEMATICS 02A-Fr2 Statistical failure analysis	NON-PROB 13-Fr2 Non-probabilistic analyses	SOFTWARE 10S-Fr2 Safety systems for real time applications 1
11:40-13:10	LUNCH BREAK					
13:10-14:30 Parallel sessions Fr3	PRA NPP 16A-Fr3 Modeling power systems	PRA NPP 16B-Fr3 HRA - panel discussion	PRA NPP 16C-Fr3 NPP reliability data	MATHEMATICS 02-Fr3 Tools for RAMS assessment	SOFTWARE 10S-Fr3 Safety systems for real time applications 2	
14:30-14:40	BREAK					
14:40-15:30 Closing session Fr4	Closing CL-Fr4 Closing					
15:30-16:00	STRAWBERRIES					
16:00	Closing of the conference					

Baltica	Marine room	Eliel (hotel)	Selim (hotel)	Kino K13
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COFFEE BREAK

EXTERNAL	RISK MANAG	SIL	INDUSTRIAL	MATHEMATICS
22-Fr2	17-Fr2	26-Fr2	20-Fr2	02BS-Fr2
Environmental impact and climate change	RI approaches for regulatory oversight	SIL - high-level considerations	RAMS 2	HRA and Bayesian analysis

LUNCH BREAK

EXTERNAL	TRANSPORT	HEALTH	INDUSTRIAL
22-Fr3	28-Fr3	25-Fr3	20-Fr3
Flooding risks	Railway safety and reliability modeling	Health care 2	Risk assessment applications 3

BREAK

08:30-09:30
Plenary session
Fr1

09:30-10:00

10:00-11:40
Parallel sessions
Fr2

11:40-13:10

13:10-14:30
Parallel sessions
Fr3

14:30-14:40

14:40-15:30
Closing session
Fr4

15:30-16:00

16:00

PL-Fr1

Europaea

08:30 – 09:30

**Plenary session: Pierre-Etienne Labeau (BELGIUM),
Antoine Rauzy (FRANCE), Luca Podofillini (SWITZERLAND)**

Chair: Enrico Zio (ITALY)

Plenary



Pierre-Etienne Labeau

Professor of reliability engineering and nuclear engineering at the Université Libre de Bruxelles (ULB), Belgium, Master in engineering physics (ULB 1992), PhD in Applied Sciences (ULB 1996)

Research fields: probabilistic safety analysis methodology for nuclear power plants and transmission power systems, dynamic reliability, maintenance modeling, risk perception

Chairman of the Belgian Nuclear higher Education Network (BNEN), invited professor at the Helsinki University of Technology (Finland) and the Ecole Nationale de l'Industrie Minérale de Rabat (Maroc), Belgium delegate in the ESFR Energy Strategic Working Group, Member of various scientific and technical committees in Europe, Belgium and France, ESRA member.

Towards R&D breakthroughs in imperfect maintenance modeling

A large amount of maintenance models are available in the literature. Most of them usually assume that the effect of maintenance interventions is as good as new. This amounts to assuming the maintenance action undergone by a system, be it preventive or corrective, is equivalent to its replacement. This hypothesis is of course questionable in many cases. Maintenance without replacement can lead to a significant level of rejuvenation of a system, either preventively or after repair. However, the restoration of the performances of the system is most of the time not complete. The effect of such an imperfect maintenance has been described in different ways.

Effective age models rest on the assumption that a (preventive or corrective) maintenance action does not affect the probabilistic law describing the equipment lifetime, but results in a shift in time within its intrinsic lifetime distribution, where the effective age replaces the calendar age. The most frequently used approaches assume that the rejuvenation obtained is proportional either to the last maintenance period or to the effective age before maintenance, introducing a unique parameter associated to the maintenance efficiency. Though the latter concepts are quite easy to interpret and apply, they were subject these last years to some critics on their inability to embody the intuitive behavior of maintained equipment, a.o. on a long time span.

This talk aims to summarize the discussions and conclusions of a dedicated, ESRA-funded workshop on imperfect maintenance modeling, hold in Chatou (France) on May 11, 2012.

09:30 – 10:00

Coffee break



Antoine Rauzy

Professor at Ecole Polytechnique (Paris, France), Senior Researcher at CNRS, Former Director of R&D System Engineering Department at Dassault System, Former Creator and CEO of ARBoost Technologies

Antoine Rauzy got a PhD in computer science in 1989 and "Habilitation à Diriger des Recherches" (the french equivalent to tenure) in 1996.

He works in the field of Reliability Engineering for more than 20 years. He made significant contributions on mathematical and algorithmic foundations of Probabilistic Safety Assessment.

He is the creator of AltaRica, a the high level language dedicated to Safety Analyses. He designed several state of the art software tools. He published more than 100 articles in International Conferences and Scientific Journals and has been the advisor of a dozen of PhD thesis.

Antoine Rauzy is now the leader of a research group at Ecole Polytechnique. He is also in charge of a Master Coursus on System Architecture. His current topics of interest are safety analyses and system engineering with a focus on languages and assessment algorithms.

Mathematical methods in reliability and safety

Due to economical and environmental pressure and increasing complexity of systems, Safety Analysts face a double challenge: first, Safety analyses must be better integrated with other engineering disciplines through the whole life cycle of systems. Second, they must be performed faster, to a larger scale and integrating many environmental configurations. This challenge cannot be faced without changing modeling formalisms and methodologies, assessment algorithms and best practices.

In a word, we need a paradigm shift. The aim of this talk is to open the discussion on problems at stake and potential solutions.



Dr. Luca Podofillini is a scientist in the Risk and Human Reliability Group of the Paul Scherrer Institute (Switzerland). He has a Nuclear Engineering degree and Ph.D. in Nuclear Engineering from the Polytechnic of Milan (2004).

His current activities include Human Reliability Analysis (HRA) research and regulatory support tasks for the Swiss Federal Nuclear Safety Inspectorate.

His research addresses the development of quantitative models of human performance in industrial systems, with focus on errors in decision-making, dynamic safety assessment, and collection of data in simulated emergencies.

He is Chair of the ESRA (European Safety and Reliability Association) Technical Committee for Human Factors and Human Reliability and member of the Board of the HRA Society (www.hrasociety.org).

ESRA TC on Human Factors and Human Reliability

The analysis of human performance is crucial to the effective risk management of industrial systems. The ESRA Technical Committee (TC) on Human Factors and Human Reliability promotes topical discussions and experience-sharing for the methodological and practical advancement of the field. This TC combines Human Factors and HRA: the idea is to help both disciplines to work better together, profiting from their complementary perspectives.

An important activity of the TC has been the organization of special technical sessions and panel discussions at the ESREL conferences. These moments of technical exchange create the opportunity for key issues to be raised and discussed. Indeed, the "word cloud" below highlights some key challenges of the field: the need for assessing HRA methods, a new role for simulator data and the development of context-based HRA approaches – an overview will be given in this talk.



16AS-Fr2	Fukushima and stress tests	
Europaea		
10:00 – 11:40	Chair: Attila Bareith (HUNGARY)	PRA NPP

Beyond standards and stress tests Momal, Patrick (FRANCE)	16AS-Fr2-1
L2 PSA application by IRSN in the context of the French additional safety assessments (“stress-tests”) performed in France after the Fukushima event. Raimond, Emmanuel (FRANCE)	16AS-Fr2-2
Use of PSA Information in the Stress Test for the Paks NPP in Hungary Bareith, Attila (HUNGARY)	16AS-Fr2-3
The European Stress Test for NPPs - Lessons Learned for PSA with special focus on external events - Experiences from Germany and Sweden Andernacht, Martin (GERMANY)	16AS-Fr2-4

16B-Fr2	HRA applications 3	
Fennia 2		
10:00 – 11:40	Chair: Ilkka Männistö (FINLAND)	PRA NPP

Re-Writing Fire Response Procedures to Reduce Fire Response Human Failure Event Probabilities Asmus, Thomas (UNITED STATES)	16B-Fr2-1
HRA for new reactors : methodological insights and first applications at EDF R&D Pesme, Helene (FRANCE)	16B-Fr2-2
Human Reliability Analysis for Small Modular Reactors Boring, Ronald (UNITED STATES)	16B-Fr2-3

16C-Fr2	CCF and dependences	
Fennia 1		
10:00 – 11:40	Chair: Marco Cepin (SLOVENIA)	PRA NPP

Dependency Analysis Guidance - Procedure and applications for CCF analysis Johanson, Gunnar (SWEDEN)	16C-Fr2-1
Common Cause Failures in critical Common Cause Component Groups for Swedish NPP Forsmark 1 Larsson, Josefin (SWEDEN)	16C-Fr2-2
General insights from the the international common cause data exchange (ICDE) project Johanson, Gunnar (SWEDEN)	16C-Fr2-3
George Apostolakis Fellowship Award Winner	
Hybrid Incorporation of Physical & Social Failure Mechanisms into Probabilistic Risk Assessment Mohaghegh, Zahra (UNITED STATES)	16C-Fr2-4
Modelling of Operator Action Dependencies in Small-Event-Tree-Large-Fault-Tree (SELF) Models Ramezani, Annette (SWITZERLAND)	16C-Fr2-5
Extension of Common Cause Analysis Bricman, Ziva (SLOVENIA)	16C-Fr2-6

11:40 – 13:10	Lunch break
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02A-Fr2	Statistical failure analysis	
Nordia		
10:00 – 11:40	Chair: Uwe Jensen (GERMANY)	Mathematics

Reliability Analysis of Lifetime Data of Electric Motors Jensen, Uwe (GERMANY)	02A-Fr2-1
A New Estimation Algorithm for Interval Censored Data from Repairable Systems Postiglione, Fabio (ITALY)	02A-Fr2-2
Gamma Process Classification According to Covariates Wang, Xuan Zhou (FRANCE)	02A-Fr2-3
Damage case prediction during the product's development process and life cycle: Evaluation of prediction methods within case studies Pospiech, Michael (GERMANY)	02A-Fr2-4
Bayes Linear Adjustments to Improve Empirical Bayes Inference for Correlated Event Rates Wilson, Kevin (UNITED KINGDOM)	02A-Fr2-5

13-Fr2	Non-probabilistic analyses	
Nautica		
10:00 – 11:40	Chair: Piero Baraldi (ITALY)	Non-prob

The cost-effective approach to selection of diverse NPP RTS under uncertainty Brezhnev, Eugene (UKRAINE)	13-Fr2-1
A New Fuzzy Failure Mode and Effect Analysis Methodology with a Monotonicity-Preserving Similarity Reasoning Scheme Tay, Kai Meng (MALAYSIA)	13-Fr2-2
A Subjective Approach for Evaluating Navigational Risk of Yangtze River Zhang, Di (CHINA)	13-Fr2-3
Dempster-Shafer Theory of Evidence to handle maintenance models tainted with imprecision Compare, Michele (ITALY) >>> Moved from session 01S-Mo4	01S-Mo4-1

10S-Fr2	Safety systems for real time applications 1	
Press Room		
10:00 – 11:40	Chair: Michael Schwarz (GERMANY)	Software

Adaptive Wireless Sensor Networks for Crisis Management Mraz, Lubomir (CZECH REPUBLIC)	10S-Fr2-1
Reliable System Design for Industrial Devices Schwarz, Michael H. (GERMANY)	10S-Fr2-2
Dynamic Reconfiguration of FPGAs in Terms of Safety Systems Hayek, Ali (GERMANY)	10S-Fr2-3
Towards safety analysis of model-based embedded software Daw, Zamira (GERMANY)	10S-Fr2-4
A fast and efficient task splitting technique to maximise CPU utilization in dependable uniprocessor systems scheduled with non-preemptive EDF Short, Michael (UNITED KINGDOM)	10S-Fr2-5

22-Fr2	Environmental impact and climate change	
Baltica		
10:00 – 11:40	Chair: Michael Knochenhauer (SWEDEN)	External
Existing Environmental And Sustainable Initiatives Among Universities in Hong Kong Lee, Wing Hang (HONG KONG, CHINA PR)		22-Fr2-1
Causality Test and Risk Analysis on Climate Change and Economic Growth for European countries, 1970-2008 Xue, Bing (CHINA)		22-Fr2-2
A novel methodology for quantitative ecological risk assessment for industrial accidents: an overview and case study Duarte, Heitor Oliveira (BRAZIL)		22-Fr2-3
Managing Climate Change Risk – the development of a climate change risk assessment and scenario-based planning tool for the water sector Rees, Daniel (UNITED STATES)		22-Fr2-4
Asset management methodology: a probabilistic approach to optimize NOx emission reduction investments for coal-fired power plants Bickert, Hélène (FRANCE)		22-Fr2-5

17-Fr2	RI approaches for regulatory oversight	
Marine Room		
10:00 – 11:40	Chair: John Wreathall	Risk manag
Risk Informed Regulatory Management of Aging Technology - Identification and application of policy alternatives for regulatory agencies Mangalam, Srikanth (CANADA)		17-Fr2-1
Approaches to Ranking Various Nuclear Facilities With a Scope of Optimizing Regulatory Activities Lankin, Mikhail (RUSSIAN FEDERATION)		17-Fr2-2
Providing a Risk-Informed Approach to the Regulatory Oversight of Medical Uses of Radioactive Materials Wreathall, John (UNITED STATES)		17-Fr2-3
Use of the PSA in the Integrated Regulatory Safety Oversight in Switzerland Schoen, Gerhard (SWITZERLAND)		17-Fr2-4

11:40 – 13:10 **Lunch break**

26-Fr2	SIL – high-level considerations	
Eliel (hotel)		
10:00 – 11:40	Chair: Henrik Kortner (NORWAY)	SIL

The agri-motive safety performance integrity level – or how do you call it? Schaebe, Hendrik (GERMANY)	26-Fr2-1
Safety integrity versus risk value Fuchs, Pavel (CZECH REPUBLIC)	26-Fr2-2
Designing Safety Functions for Complex Systems: Treating multiple hazards and shared components Alijagic, Edin (SWITZERLAND)	26-Fr2-3
Common cause failures in safety instrumented systems: Concepts and analytical approaches Jin, Hui (NORWAY)	26-Fr2-4
Systematic failures, dependent failures and common cause failures – fundamental problems regarding definitions and applications Isaksen, Stefan (NORWAY)	26-Fr2-5

20-Fr2	RAMS 2	
Selim (hotel)		
10:00 – 11:40	Chair: Jørn Vatn (NORWAY)	Industrial

Performance analysis of process plant using reliability block diagram Mokhtar, Ainul Akmar (MALAYSIA)	20-Fr2-1
Availability Analysis of Phased Mission Systems with Multiple Failure Modes Matsumoto, Satoshi (JAPAN)	20-Fr2-2
A Complex Analysis of Repairable Systems using Petri Nets Nyvlt, Ondrej (CZECH REPUBLIC)	20-Fr2-3
Safety and reliability studies in a large telescope Carretero, José A. (SPAIN)	20-Fr2-4
Reliability Analysis of a Gas Thermo Plant Considering Different Operational Conditions Saker, Leonardo (BRAZIL)	20-Fr2-5
RAMS-model for Mobile Work Machines with small production series Ellman, Asko (FINLAND)	20-Fr2-6

02BS-Fr2	HRA and Bayesian analysis	
Kino K13		
10:00 – 11:40	Chair:	Mathematics

An application of the integrated risk analysis methodology for the cooling systems of energy power plants Leger, Aurélie (FRANCE)	02BS-Fr2-1
George Apostolakis Fellowship Award Winner	
Use of a SPAR-H Bayesian Network for predicting Human Error Probabilities with missing observations Groth, Katrina (UNITED STATES)	02BS-Fr2-2
Experiences from Adapting Structured HRA Methods to the Oil and Gas Industry He, Xuhong (SWEDEN)	02BS-Fr2-3
The UK Experience In Managing Risks Arising From Human Error Embrey, David (UNITED KINGDOM)	02BS-Fr2-4
Evaluating the Bayesian Belief Network as a Human Reliability Model – the effect of unreliable data Stempfel, Yann (SWITZERLAND)	02BS-Fr2-5
New Thinking in Human Reliability Assessment: How to asses human reliability in dynamic, interactive environments Embrey, David (UNITED KINGDOM)	02BS-Fr2-6

16A-Fr3	Modeling power systems	
Europaea		
13:10 – 14:30	Chair: Antti Tarkiainen (FINLAND)	PRA NPP

On-site power systems of the new nuclear power plants Andrija, Volkanovski (SLOVENIA)	16A-Fr3-1
Application of corrective factor for the modelling of grid recovery in PSA Picca, Paolo (ITALY)	16A-Fr3-2
Probabilistic safety assessment applied to power systems reliability Cepin, Marko (SLOVENIA)	16A-Fr3-3

16B-Fr3-1	HRA – panel discussion: Errors of commission – Where do we stand?	
Fennia 2		
13:10 – 14:30	Chair: James Chang (UNITED STATES)	PRA NPP

As probabilistic safety assessment (PSA) is being increasingly used to support safety-related decision making, it is useful to examine important areas of uncertainty in order to identify what work needs to be done to improve the fidelity of the PSA models. For nuclear power plant PSA, one such area involves so-called human “errors of commission” (EOC) as exemplified by the operators’ termination of high-pressure makeup during the March 28, 1979 accident at Three Mile Island (TMI). Current thinking within the human reliability analysis (HRA) community is that the identification, modeling, and quantification of such errors require consideration of operator decision making as affected by scenario context. The technical challenges associated with such an analysis are sufficiently great that now, over 30 years after TMI, these errors are not yet incorporated in workaday PSA models. Indeed, this gap is explicitly acknowledged in current guidance documents on risk-informed decision making (e.g., U.S. NRC Regulatory Guide 1.174, “An Approach For Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes To The Licensing Basis”).

This panel session will explore the current state of HRA/PSA technology with respect to the treatment of EOCs (and other potentially risk significant errors not included in PSA models) and the work needed to incorporate these errors into current, routine analyses. The session will involve brief presentations by panelists addressing operational experience, simulator observations, and PSA modeling and application needs, as well as HRA research and development, followed by facilitated discussion.

In particular, the following topics are expected to be explored:

- For cases where EOCs have been incorporated into PSA (e.g., guidance for fire HRA that is about to be published jointly by EPRI and NRC-RES), what is the motivation for including EOCs? Also, what limitations (if any) are there for inclusion?
- What PSA experience do we have on including EOCs?
- What “real world” events involve EOCs in a significant way?
- What are the challenges for including EOCs in existing PRAs?
- What other impediments (if any) are there to including EOCs?

Keywords: HRA, errors of commission

16C-Fr3	NPP reliability data	
Fennia 1		
13:10 – 14:30	Chair: Albert Kreuser (GERMANY)	PRA NPP

The Centralized Reliability and Events Database (ZEDB), Trend Analyses of Component Populations Abusharkh, Yousef (GERMANY)	16C-Fr3-1
Data Collection in Nuclear Power Plants Baumann, Dagmar (GERMANY)	16C-Fr3-2
Evaluation of criteria for assessing component reliability paramers for use in nuclear PSA – A comparison of the German and Nordic approaches Swaling, Vidar H. (SWEDEN)	16C-Fr3-3
Experiences from implementation of updated reliability data for piping components using R-Book Swaling, Vidar H. (SWEDEN)	16C-Fr3-4

14:30 – 14:40	Break	
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02-Fr3	Tools for RAMS assessment	
Nordia		
13:10 – 14:30	Chair: John Andrews (UNITED KINGDOM)	Mathematics

RAATSS, an extensible Matlab® toolbox for the evaluation of repairable dynamic fault trees Chiacchio, Ferdinando (ITALY)	02-Fr3-1
Overcoming non-determinism in testing smart devices: How to build models of device behaviour Bishop, Peter (ITALY)	02-Fr3-2
Updating the MeDISIS Dysfunctional Behavior Database with knowledge from reliability repositories Cressent, Robin (FRANCE)	02-Fr3-3
Reliability management in conceptual design - experiences from two practical cases Valkokari, Pasi (FINLAND)	02-Fr3-4

10S-Fr3	Safety systems for real time applications 2	
Press Room		
13:10 – 14:30	Chair: Josef Börcsök (GERMANY)	Software

A stochastic approach to the probability of failure on demand (PFD) with regard to the Standard IEC 61508 Wacker, Hans-Dieter (GERMANY)	10S-Fr3-1
A new algorithm to predict the residual number of critical software failures based on imperfect debugging Krini, Ossmane (GERMANY)	10S-Fr3-2
Considering security aspects in safety environment Ugljesa, Evzudin (GERMANY)	10S-Fr3-3
Safe wireless communication for safety related systems with bluetooth technology Pendli, Pavan Kumar (GERMANY)	10S-Fr3-4
SILCas – How to calculate right safety parameters Boercsoek, Josef (GERMANY)	10S-Fr3-5

22-Fr3	Flooding risks	
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13:10 – 14:30	Chair:	External
The VNK2-project: Quantifying flood risks in the Netherlands Jongejan, Ruben (NETHERLANDS) >>> <i>Moved to session 24-Mo2</i>		22-Fr3-1
Extreme weather, sea level rise and nuclear power plants in the present and future climate in Finland Johansson, Milla (FINLAND)		22-Fr3-2
Reliability-based analysis of river dikes during flood waves Pham Quang, Tu (NETHERLANDS)		22-Fr3-3

28-Fr3	Railway safety and reliability modeling	
Marine Room		
13:10 – 14:30	Chair:	Transport
Challenges in quantifying risks in railway systems – Examples and insights from use of risk analyses in the Scandinavian railway sector Alme, Inge A. (NORWAY)		28-Fr3-1
The revision of regulation 352/2009/EC for the common safety method on risk assessment and the role of the assessment bodies in its framework Duquenne, Nathalie (FRANCE)		28-Fr3-2
Conceptual design of advanced condition monitoring for a self-optimizing system based on its principle solution Meyer, Tobias (GERMANY)		28-Fr3-3
Complex system understanding: Back to basis!! The Functional Analysis Track – Railway System Case Cointet, Alain (FRANCE)		28-Fr3-4

14:30 – 14:40 Break

25-Fr3	Health care 2	
Eliei (hotel)		
13:10 – 14:30	Chair: Henning Boje Andersen (DENMARK)	Health

A standardised FMECA and risk factors monitoring method for clinical risk assessment: Results from a Multi Centric Application Trucco, Paolo (ITALY)	25-Fr3-1
A hybrid methodology for modeling risk of adverse events in complex healthcare settings Kazemi, Reza (UNITED STATES)	25-Fr3-2
The nature of operating room time in interdisciplinary surgical operations Høyland, Sindre (NORWAY)	25-Fr3-3
Usability evaluation of an adaptation of the WHO classification for patient safety Thommesen, Jacob (DENMARK)	25-Fr3-4
Using explorative simulation to drive user-centered design and IT-development in healthcare Thommesen, Jacob (DENMARK)	25-Fr3-5

20-Fr3	Risk assessment applications 3	
Selim (hotel)		
13:10 – 14:30	Chair: Veikko Rouhiainen (FINLAND)	Industrial

Considering interactions between risks in a large contract-based project Bouissou, Marc (FRANCE)	20-Fr3-1
The geometry of risk to workers in uranium fuel cycle facilities Damon, Dennis (UNITED STATES)	20-Fr3-2
Approaches and challenges for Swedish public agencies in the performance of risk and vulnerability analyses Hassel, Henrik (SWEDEN)	20-Fr3-3

CL-Fr4	Closing plenary: Ali Mosleh (USA)	
Europa		
14:40 – 15:10	Chair: Kurt Petersen (DENMARK)	Plenary



Prof. Ali Mosleh is the Nicole J. Kim Professor of Reliability Engineering and Director of the Center for Risk and Reliability at the University of Maryland. He is a member of the US National Academy of Engineering, Fellow of the Society for Risk Analysis, recipient of several scientific achievement awards, and technical advisor to numerous national and international organizations, including his appointment

by President George W. Bush to membership on the U.S. Nuclear Waste Technical Review Board, a position in which he continues to serve in the administration of President Barack Obama. He conducts research on methods for probabilistic risk analysis and reliability of complex systems and has made many contributions in diverse fields of theory and application. These include methods and tools for dynamic PRA, cognitive models for human reliability analysis, models of the influence of organizational factors on system risk, Bayesian methods for inference with uncertain evidence, analysis of data and expert judgment, treatment of model uncertainty, risk-informed decision making under uncertainty, on-line system health monitoring, reliability growth methods, and many of the methods currently used for the treatment of common cause failures. On these topics he holds several patents, and has edited, authored, or co-authored over 400 publications. He has chaired or organized many international conferences on risk and reliability and is on the Editorial Board of several technical journals. Dr. Mosleh has led numerous projects on reliability, risk, safety, and security assessment for the nuclear, chemical, telecommunication, and aerospace industries. He has also led the design and development of more than ten major risk and reliability analysis software currently used by many industries government agencies around the world.

Delivering on the Promise: PRA, Real Decisions, and Real Events

Probabilistic Risk Assessment is now a well-established discipline with growing applications in support of rational decision-making involving important technological and societal risks. But has PRA delivered on the promise? How do we gauge PRA performance? Are there disparities between what we get and what we think we are getting from PRA and its various derivatives? What should be our expectation, and how do we address potential gaps? Prof. Mosleh will examine these questions and offer his perspective and suggestions along conceptual, methodological, and practical lines.

Closing	Closing of the conference	
Europa		
15:10 – 15:20	Chairs: Reino Virolainen (FINLAND) and Terje Aven (NORWAY)	Closing

15:20 – 16:00	Strawberry social and adjourn in the foyer outside Europa
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Map of Helsinki City Center

- X** Marina Congress Center
 - C** Helsinki City Hall
 - M** Market Square
 - R** Railway Station
 - H** Hilton Kalastajatorppa
 - S** Suomenlinna Sea Fortress
 - Z** Korkeasaari Zoo
-
- 1** Scandic Grand Marina Hotel
 - 2** Sokos Hotel Helsinki
 - 3** Hotel Haven
 - 4** Hotel Fabian



PSAM 12

Sheraton Waikiki
Honolulu, Hawaii, USA
22-27 June 2014

12th International Probabilistic Safety Assessment and Management Conference

First Announcement



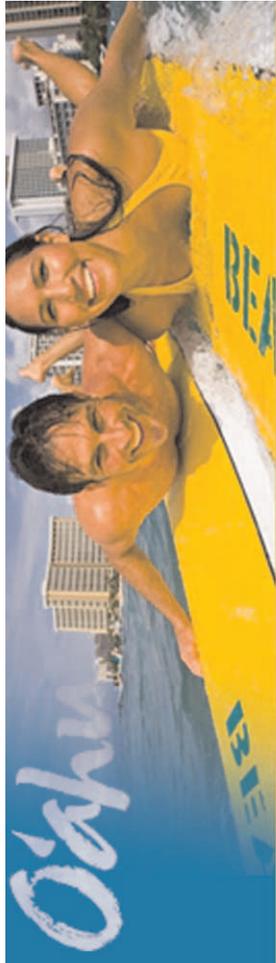
Conference website: www.psam12.org

In June 2014, the PSAM conference will take its rotation back to the United States in beautiful Honolulu, Hawaii. It is hoped that this twelfth edition of conference will be the largest PSAM yet, and attendees are encouraged to bring their families to beautiful Sheraton Waikiki.

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Important Dates

Abstracts Submission Deadline 30 September 2013
Notification to Authors 30 October 2013
Full Paper Submission Deadline 30 January 2014
Early Registration Deadline 31 March 2014
Conference Dates 22-27 June 2014

Previous Conferences

PSAM 1	Beverly Hills, USA	1991
PSAM 2	San Diego USA	1994
PSAM 3 & ESREL '96	Crete, Greece	1996
PSAM 4	New York, USA	1998
PSAM 5	Osaka, Japan	2000
PSAM 6	San Juan, Puerto Rico	2002
PSAM 7 & ESREL '04	Berlin, Germany	2004
PSAM 8	New Orleans, USA	2006
PSAM 9	Hong Kong, China	2008
PSAM 10	Seattle, USA	2010
PSAM 11 & ESREL '12	Helsinki, Finland	2012

Hula on Oahu - Authentic hula throughout Oahu at seasonal festivals, competitions, luau and live performances at hotels and resorts.



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- Enterprise Risk Management
- Environmental Impact Assessment
- Fire Simulation and Analysis
- Human Reliability Analysis
- Industrial Safety and Accident Analysis
- Lifetime and Ageing Management
- Maintenance Modelling and Optimisation
- Non-probabilistic/Soft Methods in Reliability Analysis
- Occupational Safety
- Operational Experience and Data Analysis
- Phenomena Modeling
- Policy Making and Legislative Issues
- Reliability Analysis and Risk Assessment Methods
- Risk and Hazard Analyses
- Risk Governance and Societal Safety
- Risk Informed Applications
- Risk Informed Licensing and Regulation
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- Risk Perception and Communication
- Safety Assessment Software and Tools
- Safety Culture and Human & Organizational Factors
- Safety Integrity Level (SIL)
- Safety Management and Decision Making
- Structural Reliability Analysis Methods
- Uncertainty and Sensitivity Analysis, Bayesian methods
- Other (Please, specify)

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