



European Safety and Reliability Association

Newsletter

<http://www.esrahomepage.org>

December 2011

Editorial



Enrico Zio
ESRA Chairman
Politecnico di Milano, Italy
École Centrale Paris,
Supelec, France

Dear ESRA member,

Just a short message for this last issue of our newsletter for 2011, to leave behind together the ESREL 2011 Conference in Troyes and look ahead to the next joint conference ESREL 2012/PSAM 11 in Helsinki. I look forward to your contribution and active participation to make it another focal, successful event for our Community, enlarged with and enriched by our “sisters” communities of PSAM and ESReDA.

I also take this opportunity to send you my best wishes for the coming year.

Enrico Zio
Chairman of ESRA

Feature Articles

The Deepwater Horizon accident: Lessons Learned and Recommendations for the Norwegian Petroleum Activity



Ranveig Kviseth Tinmannsvik
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Introduction

On April 20, 2010, an uncontrolled blowout of oil and gas occurred on the Deepwater Horizon drilling rig in the Gulf of Mexico. Eleven lives were lost in the accident, which was followed by a spill of nearly five million barrels of oil.

As a response to the Deepwater Horizon accident, a number of investigations and studies have been carried out. The Petroleum Safety Authority (PSA) Norway assigned SINTEF to review and systematize information from Deepwater Horizon investigation reports and other relevant accidents, including the blowout on the Montara field off the coast of Australia in August 2009 [1, 2]. The main purpose was to *contribute towards lessons learned and provide recommendations for the industry in order to reduce the likelihood of a similar accident to occur in the Norwegian petroleum activity.*

New challenges and lessons learned

In the aftermath of the Deepwater Horizon accident, an obvious question is how could so much go wrong at the same time? The accident demonstrates two important challenges; *how to maintain control of the barriers and how to manage an increasing degree of complexity*.

When studying why barriers fail, increasing *degree of complexity* is often found to be a common characteristic. A large number of involved actors and organizations need to interact. The organizations are frequently being restructured, and new work processes are being introduced. At the same time, technological development is progressing at a rapid rate, driven by deeper wells and more complex reservoirs. Offshore drilling into complex reservoirs is often referred to as a *continuous process of problem-solving*, where new and unexpected situations arise and must be dealt with on the spot. This makes new demands on safety expertise.

Operational decisions that are critical to maintain well integrity are subject to challenging framework conditions and decision makers are frequently faced with conflicting interests between production and safety. Time pressure is another disturbing factor, e.g. due to heavy workload, last minute changes of plans, or situations where operation is suspended until a decision is made. The investigation reports further reveal that the *competence of the decision makers* is a crucial aspect in order to maintain well integrity, not only related to individual skills, but also the ability to mobilize competent personnel when making critical decisions.

Recommendations

Based on the investigation reports, SINTEF suggests specific recommendations for the Norwegian petroleum industry and the authorities.

Flow of information and collaboration

Failure in the flow of information is a common cause of accidents. One of the most important recommendations for the petroleum industry is therefore *to improve the flow of information and ensure better coordination* among the many actors that have to interact in the work processes. This includes obtaining support from land-based experts in connection with safety-critical decisions and tasks during operation.

Early warnings on lack of control

Another recommendation for the industry concerns raising the level of awareness and the ability of both organizations and individuals to detect early warnings on lack of control. *Monitoring and interpretation of danger signals* are important means to detect lack of control and thus make it possible to handle situations before serious incidents occur. The recommendation includes creating awareness of risky situations in normal operations; encourage skepticism and the ability to ask critical questions; and evaluate

technological solutions that make faster detection of danger signals and errors possible.

Compliance vs. resilience

Developing *safety management strategies that both ensure compliance and resilience* is another means of increasing safety in complex and dynamic organizations. In drilling and well operations a wide range of demanding situations can occur. Different strategies are required to deal with this variability. One approach is compliance to requirements from rules and regulations. However, there is also a need to make organizations resilient, i.e. ensuring abilities to adapt to changes, and handling of unexpected situations. Important characteristics are risk awareness, response capacity and learning from experience.

How unique is the Deepwater Horizon accident?

Every accident is unique, including the Deepwater Horizon accident, but many of its causes resemble those of previous accidents and incidents. What we can be sure of is that on the Norwegian Continental Shelf we face similar risks and challenges, and that we therefore need to learn as much as possible from the Deepwater Horizon accident.

References

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Lessons learned from Adopting Distributed Simulation Approach for CI Interdependency Study

Cen Nan & Wolfgang Kröger, ETH Zurich, Switzerland

The study of interdependencies among Critical Infrastructures (CIs) is an emerging research field since modern CIs are increasingly important as well as automated and interlinked in complex ways to maintain their daily operations. These interdependencies often exert serious influences making CI more vulnerable, which is exacerbated by growing demands for more, often the same resources and timely information. It is vital to get a clear under-

standing of these often hidden interdependency issues and tackle them through advanced modeling and simulation techniques.

The challenges regarding understanding, characterizing, and investigating interdependencies among CIs are immense and research in this area is still at an early stage [1, 2]. Currently, a number of model-based approaches have been applied to investigate and analyze negative effects caused by these interdependencies, e.g., Complex Network (CN) theory, Input-output Inoperability Modeling (IIM), Petri-net-based modeling, Agent-based Modeling (ABM), etc. Due to inherent complexities of CI interdependencies, it is necessary to integrate different types of modeling approaches into one simulation tool in order to fully utilize benefits/advantages of each approach and optimize the efficiency of the overall simulation. One of key challenges for developing such type of simulation tool is the required ability to create multiple-domain models, and effectively exchange data among these models [3]. A distributed simulation approach, previously proposed in [4], has capabilities of solving this challenge by adopting the concept of modular design. Through this approach, the overall simulation tool can be divided into different simulation modules at first, which could be domain-specific or sector-specific simulation components, and then combine them in a distributed simulation platform. This approach not just potentially improve the efficiency and flexibility of the developed simulation tool, but also intends to integrate different modeling/simulation techniques in the architecture of distributed networks. Furthermore, this approach is capable to simulate all types of interdependencies (e.g., physical and geographic) among CIs, demonstrated in [5].

While several simulation standards do exist for supporting the distributed simulation approach, the most widely implemented and applicable one is the High Level Architecture (HLA) simulation standard [6]. The HLA is a general purpose high-level simulation architecture/framework to facilitate the interoperability of multiple-types models and simulations. As an open IEEE standard, HLA has been widely adopted across various fields of simulation industries during the last decade. Although, this standard has been questioned regarding its feasibility in the research field of CI interdependency study, it is still the most applicable and feasible one if compared to other similar simulation standards such as Distributed Interactive Simulation (DIS) and Aggregate Level Simulation Protocol (ALSP). One distinguished advantage of the HLA is its support of live participants, meaning that the representation of the live world such as a human being, a real process instrumentation device and a field controller, can be integrated into the simulation world.

An experimental simulation test-bed, which is part of an ongoing broader-scale project in the area of CI vulnerability and interdependency studies at ETH Zurich, has been developed to study and investigate

the interdependencies among infrastructure systems by adopting the distributed simulation approach implemented by the HLA standard. The experimental simulation test-bed is developed by following 5 working steps, recommended in [4]. Among these working steps, the most essential one is the first step, feasibility study. Not all simulation components are able to be distributed. A "pre-screening" investigation is vital for the implementation of this approach. The "fail to do so" will cause errors on simulation results and therefore, affect the overall simulation accuracy.

Experiences have been gained and lessons have been learned during the development of this simulation test-bed [7], which are summarized below:

- **Software selection:** Implementing all classes and methods that have been defined and described by the simulation standards is a complicated task, which is not recommended. There are many ready-to-use commercial software tools, by which the distributed simulation standards have been fully implemented. For example, the software package pRTI™ from the Pitch Technology is a leading tool for the HLA standard, and has been used by thousands of customers in major high-tech companies all over the world. It should be noted that if a commercial software tool for the implementation of simulation standards is used, it should be installed in a computer/server without any distributed simulation component.

- **Data exchange rate:** This is one of major concerns if multiple simulation components are included in one simulation tool and need to communicate with each other. To achieve more accurate simulation results, it is essential to have a reliable tool that is able to continuously handle large numbers of data exchanges. Therefore, a specific experiment was developed and simulators with different configurations were included in the experiment. It should be noted that the simulation standard used in this experiment is the HLA. In this experiment, a number of test datasets were created and exchanged between distributed simulation components. The maximum dataset update rate, observed in this experiment is 226 updates/second indicating that 226 datasets can be exchanged (among different components) in one second. This experiment also shows that hardware configuration of distributed components also plays an important role to achieve a more efficient simulation performance meaning that data exchange rate can be improved (increased) by using a computer or server with better hardware configuration (e.g., better CPU and more memory).

- **Determination of the number of distributed simulation components:** The total number of distributed simulation components should be carefully determined during the design stage. More distributed simulation components mean more difficulties when tuning the simulation performance. The reasonable number should be less than 10, otherwise, regulating time among distributed components will become another difficult task.

- **Time regulation:** Although time always moves forward during the simulation, the perception of "current time" might differ among distributed simulation components. Therefore, the issue of the time regulation must be addressed, especially for "time-stepped" components. In order to deviate this issue, the HLA standard provides functions and mechanisms such as time management policy for synchronizing activities among distributed components. However, the implementation of these functions and mechanisms is extremely time-consuming and will affect (slow down) the overall simulation speed. Therefore, developing your own time regulation functions according to corresponding simulation requirements and specifications is recommended.

- **Implementation of local interfaces:** One of advantages of adopting the distributed simulation approach is the possibility that existing models, previously developed for other purposes, can be reused. However, this requires the development of local interfaces that are responsible to communicate with other peer models. Several technical issues should be considered during this stage. For example, is it possible to use a different programming language (compared to the one used for the development of models) to develop local interfaces, or is it necessary to redefine the inputs/outputs of existing models, etc.

- **Simulation tuning:** After completing the development of local interfaces, the performance of overall simulation needs to be verified and optimized before conducting further experiments. For example, it is very important to ensure that the data exchange among distributed simulation components is reliable meaning that there should be no data lost during the simulation. Some (simulation standard) software tools provide user interfaces which can be used to adjust various simulation parameters such as the maximum size of each exchanged message, maximum buffer sizes, etc.

In practice, there is still no "silver bullet approach" for analyzing interdependencies among infrastructure systems. Sometimes assessing interactions among subsystems within one infrastructure system already seems very challenging. For instance, a number of approaches and methods have been applied to fully understand interdependencies between SCADA (Supervisory Control and Data Acquisition) system and its controlled/monitored electricity power supply system. Therefore, integrating different types of modeling approaches into one simulation tool by adopting the distributed simulation approach seems very promising. However, this is also not an easy task. The fundamental structure of the whole simulation tool needs to be re-constructed and the interface of each individually developed component must be compatible with its peer components. Time regulation among various distributed components is another technical challenge that needs to be carefully handled. Except these technical difficulties, more

benefits will be expected for future developments after the implementation/development of this approach, e.g., improved flexibility and modularization of simulation development, distribution of simulation work load, and possibilities of bringing real devices into the simulation and reusing models/simulators developed for other purposes.

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Safety and Reliability Books

Reliability and Safety of Complex Technical Systems and Processes: Modeling, Identification, Prediction and Optimization

K. Kolowrocki & J. Soszyńska-Budny

The book is concerned with the identification, evaluation, prediction and optimization of operation, reliability, availability and safety of technical systems related to their operation processes. The main emphasis is on multistate systems composed of ageing components and changing their structures and their components reliability and safety characteristics during the operation processes. There are presented in the book, the integrated general models of complex technical systems, linking their multistate reliability, availability and safety models and their operation

processes models and considering variable at the different operation states their reliability and safety structures and their components reliability and safety parameters. There are also presented the methods of the identification of the operation processes of complex technical systems and the procedures and formulae estimating the unknown parameters of the complex technical system components reliability and safety models on the basis of statistical data coming from the components reliability and safety states changing processes. Moreover, the methods based on the results of the reliability and safety integrated general models of complex technical systems and the linear programming are proposed to their operation, reliability, availability and safety optimization and cost analysis.

The models and methods proposed in the book are practically applied in port and maritime transportation sectors. Particularly, the comprehensive application of the methods of the operation, reliability, renewal and availability modeling, identification, prediction and optimization to the container gantry crane is performed to illustrate practically the overall approach to reliability and safety analysis of any complex technical systems.

Springer 2011 - <http://www.springer.com/engineering/production+eng/book/978-0-85729-693-1>

Vulnerable Systems

W. Kröger, ETH Zürich, Switzerland;
E. Zio, Ecole Central Paris & Supelec, France

The objectives of this publication are:

- Discusses new paradigms for reliability and risk analysis
- Provides current research on risk and vulnerability analysis of critical infrastructures
- Written by experts on vulnerable systems

The safe management of the complex distributed systems and critical infrastructures which constitute the backbone of modern industry and society entails identifying and quantifying their vulnerabilities to design adequate protection, mitigation, and emergency action against failure. In practice, there is no fail-safe solution to such problems and various frameworks are being proposed to effectively integrate different methods of complex systems analysis in a problem-driven approach to their solution.

Vulnerable Systems reflects the current state of knowledge on the procedures which are being put forward for the risk and vulnerability analysis of critical infrastructures. Classical methods of reliability and risk analysis, as well as new paradigms based on network and systems theory, including simulation, are considered in a dynamic and holistic way.

Readers of *Vulnerable Systems* will benefit from its structured presentation of the current knowledge base on this subject. It will enable graduate students, researchers and safety and risk analysts to understand the methods suitable for different phases of analysis and to identify their criticalities in application.

Springer 2011 - <http://springer.com/978-0-85729-654-2>

Safety and Risk Modeling and Its Applications

H. Pham, Rutgers University, USA (Ed.)

The objectives of this publication are:

- ▶ Provides the latest developments in both qualitative and quantitative methods of safety and risk analysis
- ▶ Includes safety and risk analysis applications in operating environments
- ▶ Written by an expert in reliability engineering

Safety and Risk Modeling presents the latest theories and methods of safety and risk with an emphasis on safety and risk in modeling. It covers applications in several areas including transportations and security risk assessments, as well as applications related to current topics in safety and risk.

Safety and Risk Modeling is a valuable resource for understanding the latest developments in both qualitative and quantitative methods of safety and risk analysis and their applications in operating environments. Each chapter has been written by active researchers or experienced practitioners to bridge the gap between theory and practice and to trigger new research challenges in safety and risk. Topics include: safety engineering, system maintenance, safety in design, failure analysis, and risk concept and modelling.

Postgraduate students, researchers, and practitioners in many fields of engineering, operations research, management, and statistics will find Safety and Risk Modeling a state-of-the-art survey of reliability and quality in design and practice.

Springer 2011 - <http://www.springer.com/engineering/production+eng/book/978-0-85729-469-2>

Recent Advances in System Reliability Signatures, Multi-state Systems and Statistical Inference

A. Lisnianski, The Israel Electric Corporation Ltd., Haifa, Israel;
I. Frenkel, Shamoon College of Engineering, Beer Sheva, Israel (Eds.)

The objectives of this publication are:

- ▶ Includes practical case studies
- ▶ Gives an up-to-date presentation of the recent developments in reliability theory based on a range of theoretical achievements
- ▶ Describes engineering applications to a variety of technical problems

Recent Advances in System Reliability discusses developments in modern reliability theory such as signatures, multi-state systems and statistical inference. It describes the latest achievements in these fields, and covers the application of these achievements to reliability engineering practice.

The chapters cover a wide range of new theoretical subjects and have been written by leading experts in reliability theory and its applications. The topics include: concepts and different definitions of signatures (D-spectra), their properties and applications to reliability of coherent systems and network-type structures; Lz-transform of Markov stochastic process and its application to multi-state system reliability analysis; methods for cost-reliability and cost-availability analysis of multi-state systems; optimal replacement and protection strategy; and statistical inference.

Recent Advances in System Reliability presents many examples to illustrate the theoretical results. Real world multi-state systems, such as power generation and transmission, refrigeration, and production systems, are considered in the form of case studies, making the book a useful resource for researchers and postgraduate students.

Springer 2011 - <http://www.springer.com/engineering/production+eng/book/978-1-4471-2206-7>

Past Safety and Reliability Events

Looking back at ESREL 2011

Troyes, 18-22 September 2011



*Antoine Grall
Chairman of ESREL 2011
Université de Technologie de Troyes
France*

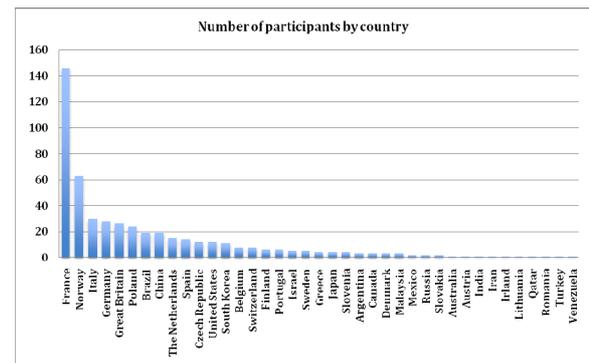
The 20th European Safety and Reliability Conference, ESREL 2011, was held in Troyes, France, between 18 and 22 September 2011. The conference was successful with a stimulating and very pleasant atmosphere. About 490 attendees from universities, research laboratories, industries, consultancy firms

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and government agency shared four days of intense technical and social activities. The Conference was principally attended by participants from Europe (83%), but also from other continents all over the world (9% from Asia, 8% from America and almost 1% from Oceania). The country distribution of participants is shown in the figure below.

Approximately 25% of participants were PhD students, which shows that there is a new generation of researchers coming up in our community.

The participants took part in an extensive program with three excellent keynote speakers presenting interesting overviews and reflections on importance measures in reliability (Professor Way Kuo, City University of Hong Kong), on risk management R&D at EDF (Philippe Klein, EDF R&D) and on the requisite variety of risk assessment (Professor Erik Hollnagel, University of southern Denmark). The presentations were scheduled in seventy seven sessions covering a broad spectrum of topics and organized in six or seven parallel tracks. 543 abstracts were received and after the review by the Technical Program Committee of the full papers, 393 papers were selected and included in the proceedings.



Four special sessions had been organized and four additional workshop and panels had been proposed : Human factor and HRA (by HRA Society), Cyndinic Panel (by IMdR), Dynamic Reliability Panel and RESS Reviewers Workshop. The combined work and effort of the authors helped by 30 Technical Area Coordinators, 60 TPC members and more than 150 reviewers resulted in a very interesting technical program relevant to current academic and industrial trends. The number of papers by thematic area and by industrial sectors are shown in the figures 1 and 2 below.

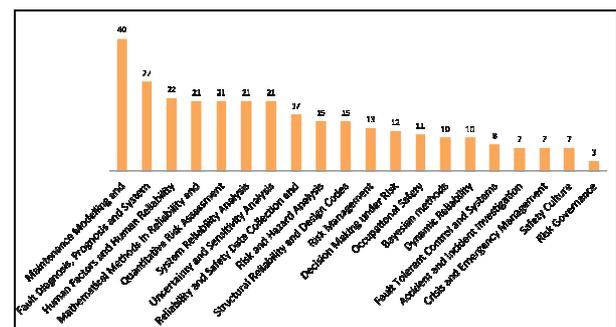


Figure 1 - Papers by thematic area

The Conference Proceedings have been published for the first time as a book of abstracts and full papers CD-ROM and have been sent by the editor to ISI (Thomson Reuters) and EI (Elsevier) for inclusion in their databases : Advances in Safety, Reliability and Risk Management. Proceedings of the European Safety and Reliability Conference, ESREL 2011, Troyes, France, 18-22 September 2011. C. Bérenguer, A. Grall, and C. Guedes Soares, editors. Taylor & Francis Group, 2012. ISBN 978-0-415-68379-1.

During ESREL 2011 we had a good mixture of work and enjoyable ambience. Every evening except on Tuesday a social event was held : on Sunday the welcome reception in the heart of the restored town center, on Monday the reception at the Troyes University of technology with different buffets and live music and on Wednesday the official conference dinner with close up magicians and cartoonists.

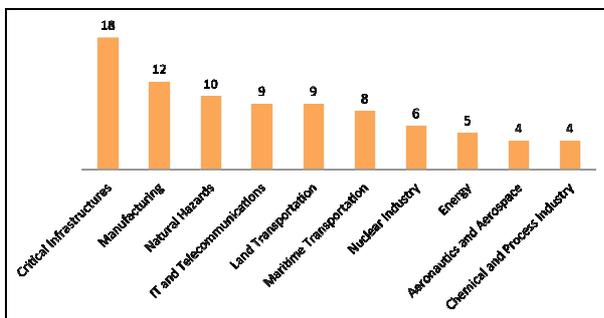


Figure 2 - Papers by industrial sector



Now the conference has ended I would like to especially acknowledge the local organizing committee (including our students and musicians) for taking care of the practical arrangement. It was an

honor and a great pleasure to have the opportunity to co-operate with you all (from technical and organizational sides) during the successive stages of the ESREL 2011 conference and you did a great job. We all are now looking forward to the next PSAM 11 - ESREL 2012 joint conference in Helsinki. I am sure we will enjoy it as much as the previous one.

ESRA Officers

New ESRA Officer – Deputy ESRA Secretary General

Coen van Gulijk, Deputy ESRA Secretary General

Dear ESRA members,

During the last ESREL Conference in Troyes, I have put myself forward as the Deputy Secretary General of ESRA. I would like to explain my motives for taking up this responsibility and provide you with a brief biography.

In my role as an assistant professor at the Safety Science group, I am responsible for developing a new program for security research. Though traditionally not a subject for the safety science group, security has areas of overlap with safety where the exchange of knowledge and experience is beneficial for both areas. The most relevant knowledge areas are risk analysis and management systems; which are relevant working areas for ESRA.

As part of my activities, I am trying to bring risk researchers that work on security in the Netherlands together. I hope that my new responsibilities in ESRA will help me do the same on an international level. For that purpose, I will start by investigating whether a Technical Committee on Security would be a viable option within ESRA. Also, I will endeavour to include security as a recognizable topic in the upcoming ESREL Conference in the Netherlands in 2013.

Meanwhile, I will be taking up the tasks of Deputy General Secretary. The first task is a memorable one: I'll send you an invoice for membership of ESRA.

Kind regards,
Coen van Gulijk

Short Biography

Coen van Gulijk has a PhD degree in chemical engineering. He is an assistant professor in the Safety Science Group at Delft University of Technology. In that role, he is responsible for education, research and development of research programs. His main focus is on chemical safety and security. Since he started working for the department in 2008 he was primarily involved in the development of new educational

programs for security. Till today that has resulted in a 6-month specialization program for bachelor students called 'Security, safety and justice' and an 18 month post doctoral course called 'Master of Security Science and Management'. Also, he is involved in the development of an international course on Nuclear Security and a masters program on risk. Coen supervises all security research projects for the safety science group and supervises four PhD students or security or security-related topics. Coen is currently involved in two EU projects on security: BEMOSA and SURVEILLE.

Before working in the Safety Science group Coen worked as a research engineer for TNO Defense, Safety and Security in Rijswijk on protection against war gas and biological weapons. In that capacity he also worked on EU projects that related to security: AIRSECURE, PATIN and PASR projects. Coen is the chairman for the PSG 32 workgroup in the Netherlands that prescribes safety and security norms for the storage of non-military high explosives.

Calendar of Safety and Reliability Events

ESReDA Seminar on Risk and Reliability for Wind Energy and other Renewable Sources Glasgow, UK, 15-16 May 2012

ESReDA is organising its 42nd Seminar in Glasgow, 15-16 May 2012 on this topic. The Seminar is hosted by the University of Strathclyde.

The coming decade should see a huge expansion of renewable energy systems, in particular of offshore wind systems. Many risk and reliability related problems for such systems are open and many may still be unarticulated. The ESReDA seminar brings together system operators, manufacturers, insurers, maintainers, government, regulators and university researchers from a variety of relevant disciplines, in order to gain a holistic view of the state of knowledge around wind energy and other renewable systems risk and reliability issues. In addition to considering renewable systems themselves, the scope of the seminar includes the embedding of such systems within the network, and the risk and reliability issues that arise as a consequence.

Papers for the seminar are invited from all stakeholders. Relevant topics for papers are: Reliability, availability and maintainability of renewable energy systems; Network stability risk analysis; and, Investment risk and economic uncertainties for renewable systems.

The keynote speaker will be Andrew Donaldson of SSE Renewables, one of the key companies involved in offshore wind.

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More details are available on the ESReDA website, www.esreda.org. ESRA is supporting this seminar through the involvement of the ESRA Technical Committee on Energy. The first call for abstracts is now out, with a deadline of 16 January 2012.

10th International Conference on Ordered Statistical Data and Its Applications (OSDA 2012) Murcia, Spain, 23–25 May, 2012

Continuing the series of Conferences in India (2000), Poland (2002-04), Turkey (2005), Iran (2006), Jordan (2007), Germany (2008), Egypt (2010), the Department of Statistics and Operations Research of the University of Murcia will host the 10th International Conference on *Ordered Statistical Data and Its Applications OSDA 2012*.

The meeting will be held at the Faculty of Mathematics, Espinardo Campus, University of Murcia, Murcia, Spain, on 23-25 May, 2012. The closing plenary conference will be held at the CIM Assembly Hall, at the Technical University of Cartagena.

In the spirit of the previous conferences, OSDA 2012 will provide an international forum for presentation and discussion of new results on ordered statistical data as well as to review and consolidate existing literature. It will be dedicated to all aspects of ordered statistical data, including (but not exclusively on): Approximations; Bounds; Characterizations; Distribution Theory and Probability Models; Stochastic Orders; Reliability Theory and Survival Analysis; Censoring; Statistical Inference; Applications of Ordered Data; Information and Entropies; Nonparametric Methods; Ranked Set Sampling; Asymptotic Theory.

On behalf of the organizing committee, we would like to invite you to submit abstracts in the topics listed above. Please forward this announcement to your colleagues who might be interested in attending the Congress.

Please visit the congress website at <https://www.um.es/symposium/go/OSDA2012> for the registration procedures and to receive up-to-date information about the Congress. If you have any question, please contact osda2012@um.es.

PHM 2012 **IEEE Reliability Society** **Prognostics & System Health** **Management Conference** Beijing, China, 23-25 May 2012

Further information on website:
<http://www.icphm.org>

CISAP-5: An Arena for New Research Trends in Safety, Reliability and Risk Assessment

Milan, 3-6 June 2012

The Italian Committee for Safety and Reliability in the Process Industry is organizing **CISAP-5**, the fifth edition of the International Conference on Safety and Environment in the Process Industry that will be held in Milan on June 3rd to 6th, 2012 (www.aidic.it/cisap5). The initiative is strongly supported by the members of the Italian Chapter of ESRA, that are contributing both to the organization and the scientific success of the initiative. The high number of abstracts received warrants that **CISAP-5** will be successful forum on process safety, risk assessment and HSE management. The conference will provide a unique opportunity to share and gain experience on open research topics in safety assessment, risk management and reliability. **CISAP** aims to become a prominent biennial forum on safety and sustainability, contributing to the consolidation of a safety culture aiming at a sustainable growth of the enterprise value based on the safeguard of the health of employees and population, the safety of operations and the environmental protection.

However, the main ambition of **CISAP** is to become an arena mainly devoted to the discussion of new and emerging research topics in safety, reliability and risk assessment. Besides the main conference, dedicated workshops will be organized on “hot” topics in emerging risk assessment and management, as the assessment of accident scenarios caused by natural hazards and the safety of energy systems and infrastructures. The experience of ESRA members is welcome both to join the conference and to propose and participate to the dedicated workshops.

2012 International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering (QR2MSE 2012)

Chengdu, Sichuan, China, 15-18 June, 2012

The 2012 International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering (QR2MSE 2012) is organized by the University of Electronic Science and Technology of China (UESTC) and the Maintenance Professional Committee, China Ordnance Society, and aims to provide an international forum for exchange of innovative ideas, research results, and applications of reliability and quality tools in design, manufacturing, and operation and maintenance of engineering systems.

Presenters may address any aspect of quality, reliability, risk, maintenance, and safety. Participation from academia, industry, and government are all welcome. Papers dealing with case studies, reliability data generation, experimental results, best design practice, or effective maintenance solutions are of particular interest. All papers accepted will be included in the conference proceedings and IEEE Xplore. Every effort will be made to ensure that the conference proceedings be indexed by EI and ISTP. Selected papers will be published in special issues/sections of international journals.

Submit abstracts and papers via the conference website. Please check the conference website at www.qr2mse.org for more information and updates, or contact us at secretariat@qr2mse.org.

IMPORTANT DATES

Full Paper Submission Deadline Feb. 29th, 2012
Full Paper Acceptance Notification Mar. 31st, 2012
Camera Ready Papers Due Apr. 30th, 2012

Website: <http://www.qr2mse.org>

ESREL 2012- PSAM 11 European Safety and Reliability Conference International Probabilistic Safety Assessment and Management Conference

Helsinki, Finland, 25-29 June 2012

ESREL 2012 & PSAM 11 will be the major international event in the safety, reliability and risk fields in 2012. The Conference brings together experts from various industries, research organisations, regulatory authorities and universities. It offers a platform for contacts between different fields from nuclear, process and chemical industries, offshore and marine, space and aviation, IT and telecommunications, bio and medical technology, civil engineering and financial management. The multi-disciplinary Conference is aimed to ensure the cross-fertilization of methods, technologies and ideas.

The program will be a blend of ESREL - PSAM traditions and *Nordic Footprints* in the safety, reliability and risk areas.

About 1000 abstracts from about 50 countries have been received. A number of special sessions are planned covering topics like uncertainty treatment, vulnerability of critical infrastructures, safety systems, maintenance modeling, PSA in aviation, assessment of radioactive waste repositories, and system health monitoring, fault diagnosis and prognosis.

Abstracts/papers are being organized into relevant areas and sessions. Track leaders for the main topics and application areas have been appointed.

Important Dates:

Submission of full-length papers: 31 January 2012

Reino Virolainen, *Conference General Chair*
Terje Aven, *Program Committee Chair*

Website: www.psam11.org

10th International Probabilistic Workshop

Stuttgart, Germany, 15-16 Nov., 2012

The conference is intended for civil and structural engineers and other professionals concerned with structures, systems or facilities that require the assessment of safety, risk and reliability. Participants could therefore be consultants, contractors, suppliers, owners, operators, insurance experts, authorities and those involved in research and teaching.

The event is organized by the Institute of Geotechnical Engineering, University of Stuttgart, Stuttgart, and the Institute for Mountain Risk Engineering, University of Natural Resources and Applied Life Sciences, Vienna.

Submission deadlines

Submission of abstract: 1st May 2012

Submission of final paper: 17th August 2012

Website

http://www.uni-stuttgart.de/igs/igs_versehiedenes/Veranstaltungen/Probabilistic_Workshop

Further information from:

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ESRA Information

1 ESRA Membership

1.1 National Chapters

- French Chapter
- German Chapter
- Italian Chapter
- Polish Chapter
- Portuguese Chapter
- Spanish Chapter
- UK Chapter

1.2 Professional Associations

- The Safety and Reliability Society, UK
- Danish Society of Risk Assessment, Denmark
- SRE Scandinavia Reliability Engineers, Denmark
- ESReDA, France

- French Institute for Mastering Risk (IMdR-SdF), France
- VDI-Verein Deutscher Ingenieure (ESRA Germany), Germany
- The Netherlands Society for Risk Analysis and Reliability (NVRB), The Netherlands
- Polish Safety & Reliability Association, Poland
- Asociación Española para la Calidad, Spain

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- Total, France
- Commissariat à l'Energie Atomique, France
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- VEIKI Inst. Electric Power Res. Co., Hungary
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- D'Appolonia, S.p.A, Italy
- IB Informatica, Italy
- RINA, Italy
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- Atkins Rails, UK
- W.S. Atkins, UK
- Railway Safety, UK
- Vega Systems, UK

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- University of Innsbruck, Austria
- University of Natural Resources & Applied Life Sciences, Austria
- AIT Austrian Institute of Techn. GmbH, Austria
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ESRA is a non-profit international organization for the advance and application of safety and reliability technology in all areas of human endeavour. It is an “umbrella” organization with a membership consisting of national societies, industrial organizations and higher education institutions. The common interest is safety and reliability.

For more information about ESRA, visit our web page at <http://www.esrahomepage.org>.

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