European Safety and Reliability Association

Newsletter

http://www.esrahomepage.org December 2013

Editorial

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

Dear ESRA Colleagues,

A new year has started, in all parts of the World, including ESRA!

While we have been making wishes and promises for the new year, I hope that special ones have gone to our devotion for the responsibilities in the professional activities that each of us carry out in the practice and, then, take to the ESRA community for sharing, exchanging and valorisation of our efforts to improve safety in the technological World we live in.

More than a promise I hope you have made in joining us at the next ESREL 2014 which will be held in Wroclaw, Poland, in September (did you submit your abstracts???). It is, yet, another unique opportunity to meet and discuss our research advancements and technical successes in practice, and to learn about new challenges in the field. Our colleagues in Poland are going through an extensive effort to make this Conference another unforgettable moment, as you will read in the newsletter issues.

As done in the past 3 years, ESRA has launched to its members a call for proposal of financial support to initiatives by technical or national committees and individual groups of members, for activities of interest to the ESRA members. I am glad to inform you that the number of proposals is increasing every year, and the commitment of ESRA is strong in supporting technical initiatives valuable for its members and for advancements in the fields of Safety and Reliability. Read about these initiatives in this and the upcoming newsletter issues, and grasp the opportunities they offer, of involvement and participation in courses, summer schools, workshops, working groups. At a side, we hope that these projects can give the opportunity to lay the ground for more collaboration and cooperation, possibly sparking the seeds for bigger projects, for example within the H2020 funding scheme of the European Union.

It is nice to witness that the ESRA community does not stop to stimulate and initiate technical reflections on relevant topics of Safety and Reliability. One recent initiative is that of the opening of a Technical Committee on “Foundations of Risk and Reliability Assessment and Management” (for short, “Technical Committee on Foundations”), pushed and animated with his characteristic enthusiasm by our Vice-Chairman, Professor Terje Aven of University of Stavanger. Read about it in this issue and join-in with your participation and contribution.

Finally, I am proud to say that ESRA continues to attract new members from all over the World: be prepared to welcome new faces and experiences. And with respect to membership, let me ask you once again to proceed promptly with the payment for the renewal of your membership to ESRA: it is important to us that we can continue counting on your personal involvement and professional expert contribution in our activities; at the same time, your fee is an important contribution to these activities of our community to the benefit of all its members. Please go on our website www.esrahomepage.org and proceed as indicated.

With kind regards,

Enrico Zio
Chairman of ESRA

Feature Articles

Living Risk Analysis

John Robert Taylor
AltorRisk and Process Safety JLT
Abu Dhabi, UAE

From its beginnings in the early 1970's, process plant risk analysis has developed from a research area, through a field of development, until it is now an accepted engineering technique. However it is still largely used for regulatory approval. The procedures are developed so that formal risk assessments are presented at each stage of authority approval. For this purpose, the methodology modelling and a large part of the input data must be standardised and pre-approved by authorities, in order to ensure that the analyses are repeatable, and consistent across a range of installations.

There is another need for risk assessment however. Engineers, having accepted the principle of risk assessment, have increasingly asked for results which will be of help to them in design and in operations. This is a trend which has developed internationally particularly since the early 2000's. This kind of risk analysis answers questions such as "do we need passive fire protection on this part of the piping" or "where should we place temporary refuges in order to protect employees".

To answer this kind of question requires much higher quality of modelling for the risk analysis. Good answers to engineering questions require, for example, three dimensional and dynamic modelling. Also, a much wider range of accident physics models is needed, especially those used to calculate prevention and mitigation effects. Regulatory risk analyses cannot at present answer such questions properly.

A living risk analysis [1] is one created at the early design stage, and continuously updated through the entire course of design, construction, commissioning and operations, and is the property of the design and operations teams. It allows input from HAZOP and similar studies, in addition to input from standardised tables of release frequencies. It is developed particularly to allow ALARP analysis of the hundred or so loss prevention and risk reduction options available to the plant engineers. Also, it focusses not just on human, but also on asset risk.

Experience from some 15 installations which have adopted a living risk analysis approach were reviewed, and compared with similar plants which did not take this approach. In every case, the risk reduction measures applied for the plants with living risk analysis were more extensive and in calculations, produced a greater risk reduction, on average by a factor of about 22, as calculated. It is too early to tell whether this approach will in actuality lead to fewer and smaller accidents, but near miss analyses have already begun to indicate that this is so.

Reference

1. A Guide to Living Risk Assessment, ITSA, 2013

What is resilience – and does it bounce?

Rasmus Dahlberg
PhD Fellow
COPE (Copenhagen Center for Disaster Research), University of Copenhagen, and DEMA

Resilience is currently a buzz-word in academia as well as the professions. In his recent etymology of the concept, David Alexander identifies attempts in recent years to "create a resilience *paradigm*" and states that the term can be applied to any kind of system that experiences shocks whether physical or social – even if the extreme openness of social systems poses a serious challenge to this emerging scientific field (Alexander 2013, 1272).

From engineering to social science, from psychology to ecology the term has been widely used over the last decades to describe a system's ability to bounce back from sudden impact. Resilience may be differentiated from "resistance" which is "the extent to which disturbance is actually translated into impact" (Adger 2000, 349): While a system's resistance protects it from an agent of threat by deflecting the shock, resilience is what enables the system to absorb and bounce back from the impact. In disaster and emergency management terms resilience thus permeates the entire cycle of mitigation, preparedness, response and recovery.

However, a resilient system is not merely robust. "Robustness" may be defined as a property of a simple or a complicated system characterized by predictable behavior, enabling the system to bounce back to its normal state following a perturbation. True resilience can be obtained in complex systems with a high degree of interconnectedness and fuzzy boundaries. For a useful distinction between simple, complicated and complex systems the Cynefin Framework is recommended (Snowden 2007). Alas, a system's level of resistance protects it from shock, and its robustness lets it bounce back to normal, while its resilience enables it to absorb perturbation and adapt, thus bouncing back to a "new normal".

Originating from Latin (resilire, "bounce"), resilience was first used in a somewhat modern sense by the great scholar Francis Bacon in 1625. Historically, the

term developed from literature and law through scientific method in the 17th century and it entered the language of both mechanics and child psychology in the 19th century. The engineers of the Industrial Revolution thought in terms of resilience when they added redundant strength to structures such as buildings and bridges. In general the concept retained the original core meaning of "bouncing back" regardless of the system being mechanical or psychological. It was not until the second half of the 20th century, though, that resilience found its way into the social sciences as an attribute of open systems (Alexander 2013).

In his 1973 seminal paper, the ecologist Crawford Stanley Holling defined resilience as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (Holling 1973, 14). This idea of resilient homoeostasis (dynamic instability) became highly influential in the following decades of integration of the concept into social science, sociology and climate studies. Around the same time as Holling wrote his influential article, the term resilience was also picked up by psychologists (via anthropology) as a substitute for robustness (Kolar 2011).

By the turn of the millennium the term continued its journey when the relationship between social and ecological resilience was developed into a broader understanding of community resilience (Adger 2000). The Hyogo Framework for Action, (an UNISDR-initiative), adopted by 168 UN members in 2005, placed resilience on the international agenda by focusing on the concept of resilient communities such as cities, neighborhoods and networks as a corner stone in future humanitarian development (www.unisdr.org.). In recent years both the UK and US governments have taken on a "resilience approach" to Disaster Risk Reduction/emergency preparedness (Cabinet Office 2011, National Research Council 2013).

Today, a commonly accepted definition of resilience is the "capacity of an individual, community or system to adapt in order to sustain an acceptable level of function, structure, and identity". Note the emphasis on adaptation: what makes a system truly resilient is its learning and transformational capabilities, not its ability to resist a shock or the robust "bounce back" to a previous state. It follows, then, that an up to date understanding of resilience is synonymous with what Nassim Nicholoas Taleb calls "antifragility" (Taleb 2012): systems that not only survive disturbance and disorder but actually develops under pressure.

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Maintenance Policy Selection: research put to practice

Adriaan Goossens

Maintenance policy selection is a key decision in the process of maintenance decision making: it has a great impact on the effectiveness and efficiency of maintenance. Also, maintenance requirements of a capital asset change throughout its life-time. These changes can be initiated due to several reasons, for example, the warranty period passes and prescriptions by suppliers no longer have to be followed, the use of the asset changes over time, or new (maintenance) technologies emerge. However, current selection heuristics do not always neatly fit to maintenance organizations, and these heuristics provide only limited understanding and insight in the maintenance decision and the underlying reasons and criteria for the choice of policy. So, while maintenance policy selection is important, these drawbacks undermine practicality and feasibility, two factors that must not be overlooked if the chosen maintenance policy is to succeed in practice.

Our research at the University of Twente, at the chair of Maintenance Engineering, focusses on tackling these drawbacks. We are investigating a way of maintenance policy selection that creates understanding, and takes into account not only the measurable goals (such as KPIs), but also the intangible, softer factors that provide the fit to the company, such as experience, relations and company culture. We have started this research focussing on the Royal Netherlands Navy and related companies.

To investigate maintenance policy selection, four subjects need to be covered: firstly a set of maintenance policies to choose from, secondly a decision method, thirdly a set of criteria that play a role in the decision, and lastly a way to validate whether the results of our investigations indeed tackle the drawbacks. We will elaborate on these four items one by one.

Maintenance policies come with many names and many slightly different definitions. Formalized, a maintenance policy is a policy that dictates which parameters (for example, elapsed time or amount of use) trigger maintenance actions. For our research, we use a set of six, drawn from scientific literature:

•failure-based maintenance: maintenance is performed correctively only, meaning that one deliberately waits for something to break or fail;

• calendar-time-based maintenance: maintenance actions are performed at fixed time intervals, for example, every month or year;

• use-based maintenance: the actual use triggers maintenance, such as kilometres driven or hours run;

• use-severity-based maintenance: not the use, but its severity triggers maintenance, for instance off-road kilometres compared with on road kilometres in stead of just the total kilometres driven;

• load-based-maintenance: measured internal loads trigger maintenance; for example, the measured strain in a certain structural component;

• condition-based maintenance: a measured condition dictates maintenance actions, such as particular levels of vibration or amounts of dissolved metal parts in oil.

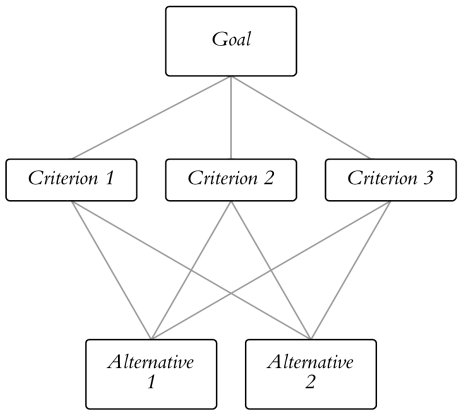
These six policies provide the alternatives to choose from when selecting a maintenance policy. The decision method must provide a way to use the criteria to select, or decide on, one of the alternatives. Due to the complexity of the decision and the diversity of the criteria, a multiple criteria decision method is appropriate. Therefore, we use the Analytic Hierarchy Process (AHP), a multiple criteria decision method developed in the 1980s by Thomas Saaty. The AHP has several advantages that fit the problem under investigation. Firstly, it is designed to integrate objective, subjective, qualitative and quantitative information. Adding to that, it creates a thorough understanding of the problem by structuring the problem hierarchically.

The way it pairwise compares the criteria and alternatives provides simplicity and ease of use.

Lastly, the AHP is a well established multiple criteria decision making approach, in both academia and industry, known to produce plausible and defensible results.

The process works in four steps, resulting in the final priorities of the alternatives, in this case the six maintenance policies. The steps are as follows.

1. Define the problem and the goal of the decision.
2. Structure the decision hierarchically, starting at the top with the goal of the decision, via the criteria and sub-criteria, to the lowest level, which is a set of the alternatives.
3. Construct a set of pairwise comparisons. Each level in the hierarchy is used to compare the sub-criteria immediately below it.
4. Use the priorities obtained from the comparisons in Step 3 to weight the priorities at each level in the hierarchy. Then obtain the overall priorities for each level of the hierarchy. Continue this process until the final priorities of the alternatives in the bottom most level are obtained.



Example hierarchy for the Analytic Hierarchy Process.

The criteria that play a role are explored in two ways: by examining scientific case studies in which the AHP is used for maintenance policy selection (although in other industries than shipping) and by conducting interviews at the Royal Netherlands Navy and companies that are closely related, such as a shipbuilder, a classification society, an original equipment manufacturer and a maintainer. In total 9 scientific cases were examined and 8 interviews were conducted.

This resulted in a list of over 180 possible criteria. These were trimmed down to around 45 workable and applicable criteria. While forging the list of criteria into a hierarchy usable with the AHP, several clusters could be formed. The two main clusters that were formed are *goals* and *fit to company*. *Goals* is further divided into *KPIs* and *desirables*. *Fit* could be divided in six sub-clusters: a) *fit to crew*; b) *fit to knowledge*; c) *fit to mission*; d) *fit to relations*; e) *fit to spare parts*; and f) *fit to maintenance tasks*. This shows that indeed the softer, qualitative criteria do play an important role in maintenance policy selection.

Validation of the used criteria, as well as the hierarchy along with the AHP, lies in bringing it to practice. To do so, we are currently organizing test-sessions at the Royal Netherlands Navy and the other companies. At these sessions the AHP is used with our hierarchy to select the most suitable maintenance policy for a case selected by the company.

Although only two sessions have been held at the time of writing, the results of these sessions are very positive. The attendees indicate that this is a both useful and interesting way to approach maintenance

policy selection, during which better insight in the selection process is gained.

However, besides the Navy, we also want to bring these session to other, most likely maritime industries to research if what we have learned at the Navy also holds for other industries. This way we aim for an even better understanding of maintenance policy selection.

To summarize, in order to address the drawbacks of the current ways of maintenance policy selection, we have explored an alternate way of looking at maintenance policy selection. We have defined six different maintenance policies, and shown that the AHP is a useful decision method for these decisions.

The criteria that play a role were drawn from both scientific literature and interviews with practitioners. Armed with the alternatives, the AHP and the criteria, we are currently taking our results to practice, organizing test sessions in industry with very positive results – starting at the Royal Netherlands Navy, but looking further as we go.

The author is a PhD student at the University of Twente, Enschede, The Netherlands, at the chair of Maintenance Engineering, within the faculty of Engineering Technology. The chair of Maintenance Engineering is headed by Prof. dr. ir. Leo van Dongen, and the research is supervised by dr. ir. Rob Basten.

The author gratefully acknowledges the support of Lloyd's Register Foundation. Lloyd's Register Foundation helps to protect life and property by supporting engineering-related education, public engagement and the application of research.

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http://www.utwente.nl/ctw/opm/staff/ME/GoossensAJM/
http://www.utwente.nl/ctw/opm/research/maintenance_engineering/

Past Safety and Reliability Events

First Brazilian Conference on Risk Analysis, System Safety and Reliability

Enrique López Droguett

President of ABRISCO,
Chairman of the Technical Committee of ABRISCO 2013Associate Professor and Director of the Center for Risk Analysis, Reliability and Environmental Modeling, Federal University of Pernambuco, Brazil

Luiz Fernando Seixas de Oliveira

First Vice-President of ABRISCO,
Chairman of the Organizing Committee of ABRISCO 2013 Vice-President for DNV GL, Business Development Manager Region South America

The First Brazilian Conference on Risk Analysis, System Safety and Reliability took place in Rio de Janeiro between 25th and 27th of November 2013, and it was a major success by all accounts. This event was the first general conference of the recently founded Brazilian Association for Risk Analysis, Process Safety and Reliability (ABRISCO).

The opening plenary lecture was brilliantly delivered by Professor Carlos Guedes Soares, followed by a round table on the "Importance of Process Safety and Reliability in Process Industry Operations", with representatives from Petrobras, BG-Group Brazil, and Braskem.

The conference main goals were to make a comprehensive mapping of the research and development activities in the areas of risk analysis, process safety and reliability conducted in Brazil by Brazilian universities and companies, and to encourage and spark the interest and participation of the young generation of researchers, undergraduate and graduate students.

The conference accomplished both goals with competence, as confirmed by the final numbers. In fact, 105 papers made the final technical program considered highly representative of the excellent work that has been carried out in Brazil in the areas of the conference. The final attendance was also above the initial expectations with 175 participants, of which 135 from private sector companies and Brazilian Federal Agencies, and 40 from Universities. In terms of thematic areas, Figure 1 shows the distribution of the number of papers, with a preponderance for Risk Analysis (29%), closely followed by Process Safety (22%), System Reliability and Human Reliability, each with 17%.

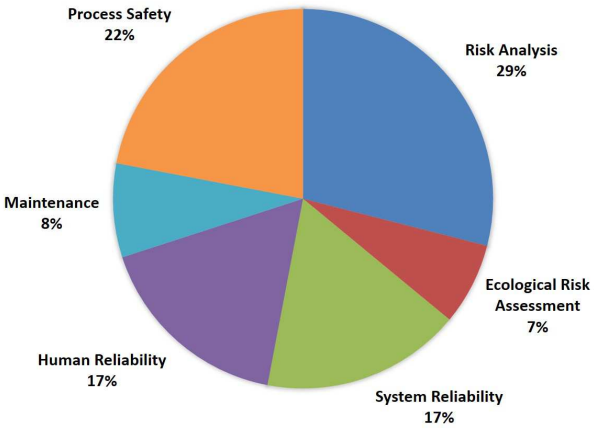

Figure 1 – Paper distribution by thematic area

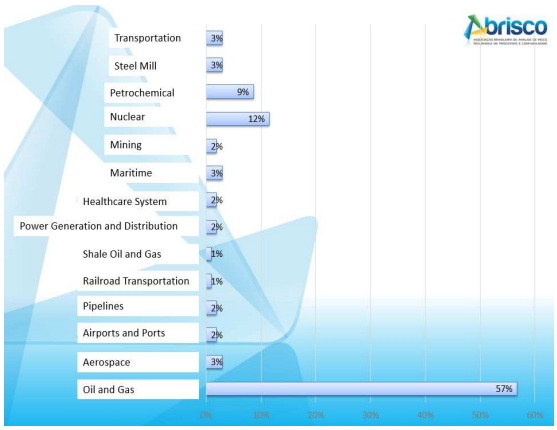

Figure 2 – Number of papers by application area

In terms of application areas, Figure 2 shows a strong dominance of the number of papers in the Oil & Gas sector (57%), with Nuclear Engineering and Petrochemical sectors in distant second and third places. If this is an expected result, which mirrors the current industry-wide bias towards Oil & Gas applications in Brazil, it also presents a great growth potential for ABRISCO in all other areas.

Following the success of this first conference, the next big event to be organized by ABRISCO will take place on November 23rd-25th, 2015, also in Rio de Janeiro. It will be a double event, in conjunction with IAPSAM, where we will hold the 2nd General Conference of ABRISCO and a PSAM Topical Meeting on Safety and Reliability of Offshore Installations. Furthermore, the next event will target a broader community not only from Brazil and but also from abroad. All ESRA members are hereby invited to submit papers and attend the next conference.

Figure 3 – From left to right: Carlos Guedes Soares, Enrique López Droguett and Luiz Fernando de Oliveira.

2013 IEEE Workshop on Integration of Stochastic Energy in Power Systems

Anatoli Paul Ulmeanu, Nikolaos Limnios – TPC Chairmen

Enrico Zio – Publication Chair

This workshop took place on 07.11.2013 in University Politehnica of Bucharest (UPB), Romania and was chaired by Prof. Anatoli Paul Ulmeanu from University Politehnica of Bucharest, Prof. Nikolaos Limnios from Universite de Technologie de Compiegne, France (Technical Programme Committee Chairs) and Prof. Enrico Zio from Polytechnic of Milan (Publication Chair). University POLITEHNICA of Bucharest, Faculty of Power Engineering, Department of Power Generation and Use, Laboratory Reliability of Power Systems took this opportunity to pay a scientific homage to Cezar Ionescu's and Vasile Nitu's works in bridging mathematics with problems in power engineering.
This event has benefited greatly from the scientific / logistic support of Adrian Badea, Vlad-Ştefan Barbu, Radu Dobrescu, Virgilius Dumbravă, Cornel Erbaşu, Mircea Eremia, Ioan Felea, Virgil Muşatescu, Iulian Năstac, Bujor Păvăloiu, Lucian Toma and Rodica Tuduce.

The workshop has been scheduled together with the 6th International Conference on Energy and Environment (CIEM) which is organized by the Faculty of Power Engineering, Institute for Studies and Power Engineering (ISPE) and the WEC-Romanian National Committee (CNR-CME).

The papers collected in Proceedings cover the topics of stochastic models in power energy systems, by merging the methodological aspects with the concerns arising from practical applications.
The Proceedings are now indexed and available. The access is provided by the IEEE Xplore Digital Library.

In Memoriam
Professor Dumitru Cezar Ionescu 1946-2005

He held a B.S. degree in thermoenergetics obtained in 1969 from the Polytechnic Institute of Bucharest, Romania. In 1975 he successfully finalizes his doctoral thesis achieving the Ph.D title in the reliability of thermoelectric power plants. Some of the research has been conducted during exchanges at the Power Institute in Moscow, Russia. Starting from 1993, he held various experience exchanges with many famous institutions and universities abroad, e.g., Université

de Technologie de Compiègne, Conservatoire des Arts et Métiers, INSTN Saclay, Electricité de France. In 1990 becomes tenured professor with the University Politehnica of Bucharest, Power Faculty, Department of Power Plants and further in 1990 obtains his habilitation on conducting doctoral studies in the field of Power Reliability.

Even from the beginning of his carrier he has been constantly involved in various coordination activities of the faculty, as Vice-Dean (1980-1989) and Dean (1990-2000) followed by the coordination of the University Politehnica of Bucharest as Vice-Rector (2000-2005). He held many leading positions as President of National Higher Education Accreditation Council (1996-1998), member of the Romanian National Committee for the World Power Council (1991-2005), member of the Boarding Council of the Romanian Society of Power Engineers SIER (1992-2005), member of the Power Commission and Power Engineering Thesaurus Commission of the Romanian Academy (1991-2005), member of the Romanian National Council for Scientific Research in Higher Education (1997-2005), member of the Administrative Council of the Romanian Association for Romanian Power Politics APER (1996-2005), member of the Boarding Council of the National Romanian Accreditation Network RENAR (1999-2005), President of the Research Center of Power and Environment at Power Faculty, UPB (2000-2005), member of the Boarding Council of the Romanian Power Institute (2002-2005).

He coordinated several strategic programs that contributed to strengthen the position of the institution at international level as well to improve education and research, coordinator of the TEMPUS ENVIROM program (with partners from other 7 European countries) in the field of power economy, protection of the environment and feasibility of power equipments, coordinator of the TEMPUS SENECA program (with partners from 4 European countries) on nuclear security and radio protection, coordinator of the TEMPUS UNICAS program for improving academic management, coordinator of the modernization program for University Politehnica of Bucharest funded by the World Bank and Romanian Ministry of Education, director of the grant for Advanced School for Quality, Feasibility and Security of Technical Systems funded by the World Bank and Romanian Ministry of Education, director of the project for the National Center of Power Research, director of the INFRAS grant for the National Agency for the Certification of the Management and Personnel System in Higher Education, director for the CALIST grant on the Evaluation of the UPB Quality Management System, director for the CALIST and CALISRO grants for the Evaluation of the Quality in Higher Education in Romania (coordinated by University of Bucharest).

In 1996 he was one of the first pioneers to contribute to the process of aligning and adapting the education system of the University Politehnica of Bucharest to international standards by studying and successfully implementing the European Credit Transfer System (ECTS) with UPB. He funded and coordinated the UPB ECTS Credit Commission (1996-2005) that supervised and constantly improved the system that we use today.

His research interest covered reliability of networks and complex systems. He coordinated many students in various license, master and doctoral degree projects. He has been involved in organizing several scientific events in the filed, as organizer, chair or part of the technical program committee, e.g., International Conference on Mathematical Methods in Reliability MMR 1997, International Conferences on Safety and Reliability KONBiN 2001, ESREL International Conference of the European Safety and Reliability Association. He is the author or co-author for more than 18 books, 30 journal publications, 80 papers presented at international and national conferences and contributed to the succes of more than 34 research grants.

For more than 40 years, he has been dedicated entirely to his passion for the education and research, starting from the very first years as student of the Power Faculty and finalizing as Vice-Rector of the University Politehnica of Bucharest. His entire activity significantly contributed to the foundation of the very first power engineering school in Romania.

In Memoriam
Professor Vasile Nitu 1927 - 2005

Great scientist with impressive achievements on both the academic and engineering front and an even greater human being. As a person he was loved and he was respected as a scientist, professor, colleague, friend and family member. He was born in Oniceni, a small village in Moldavia, Romania where he went to primary school. Being a school loving child he continued his studies at a prestigious highschool in Iasi on scholarship. Later he graduated from the Electromecanic Faculty at the Politechnic Institute of Timisoara, Romania and went for his Ph. D. at the Energy Institute of Moscow. In 1954 he defended his Ph. D. thesis. This was the first scientific paper where probabilities were applied to the field of power systems. In future papers he used more and more probabilities in the studies of power systems developing the foundation in the field of power systems reliability. During his stay in Moscow he met his future wife, Coca, who was studying for her Master's Degree in Electrical Engineering. They got married in 1952.

He started his career at the Power Systems Research Institute (ISPE) in Bucharest, Romania in 1955 where he progressed to President and CEO in 1963. Here he directly contributed to many projects that enabled the rapid development of the Romanian Power Grid

going from a 5% national coverge in 1955 to 80% in 1980. Without a doubt, ISPE reached its well deserved international reputation due to his wise leadership. His human touch, his long lasting friendships, his fairness, leadership and compassion helped build a strong cohesive professional team. In parallel to working at ISPE he taught university courses at the Oil and Natural Gaz Institute and since 1971 at the Politechnic Institute of Bucharest. In 1974 he received his D.Sc. (Doctor Habil) in the field of power system reliability. In 1981 he dedicated his entire professional activities to the academic career. In 1993 he emigrated to Canada with his wife. This radical change didn't slow down his enthusiasm. Shortly after setling in Canada, he founded the Canadian Institute World Energy System and the related scientific magazine and conference. Starting in 1996 he published papers on globalization of energy production and consumption. His scientific work includes over 300 papers, of which a third published in English, French and Russian, and 26 books on reliability and theory of power systems. In 1975 his book "Power Generation Stations" received the prestigious Romanian Academy award Traian Vuia. He received a number of other medals and awards for his outstanding contribution to the development of the national power grid and Romanian Power Systems. He participated and contributed to numerous international forums such as CIGRE (Conference des Grandes Reseaux Electriques), World Energy Organization to name a few.

Throughout his busy career he managed to find time for his daughters. From all his extensive travel he always remembered to bring them souvenirs, toys and stories. The family vacations and trips developed in his daughters the love for discovery and adventure. He shared his thinking and work stories with them and he had a strong influence on their professional development.

ESRA News

A new ESRA Technical Committee on Foundations of Risk and Reliability Assessment and Management

Foundations of risk and reliability assessment and management cover general concepts, theories, frameworks, approaches, principles methods for the understanding, assessment, management and communication of risk and reliability in technological contexts.

Given the importance of Foundations, at the beginning of this year ESRA has established a new Technical Committee (TC) on such matters: we refer to this TC as "Technical Committee on Foundations", for short.

The objectives of this Technical Committee are to:

- provide leadership and play an active role in advancing the foundations of risk and reliability assessment and management;
- facilitate the exchange of ideas and knowledge on the subject among practitioners, researchers, scholars, teachers;
- encourage collaborative research on the subject;
- exchange on subjects of educational programs.

Examples of topics addressed within the Committee are:

- How to understand and describe risk and reliability
- How to treat uncertainties in risk and reliability assessments
- How to understand and treat model uncertainty
- How to conceptualise and deal with black swans
- How to use the precautionary principle in risk management
- How to make use of signals and warnings in risk and reliability assessments
- Risk analysis as a science

It is a primary aim of the Technical Committee to stimulate papers for presentation at the ESREL conferences and publication in the ESRA journal on Reliability Engineering and System Safety. A first activity is the special "discussion session" at ESREL 2014 in Wroclaw, Poland next September, titled:

"Black swans: are we equipped to assess and manage them?"

Also, synergies and collaborations will be sought with the mirror Specialty Group of the Society for Risk Analysis, also recently established (http://www.sra.org/frasg).

All ESRA members are warmly invited to join the discussions and advancements within the TC on Foundations, by please writing an email to the Chairmen:

Terje Aven (terje.aven@uis.no) and Enrico Zio (enrico.zio@polimi.it).

Calendar of Safety and Reliability Events

7th International Conference on Pervasive Technologies Related to Assistive Environments (Petra 2014)

Rhodes Island, Greece
27-30 May, 2014

The 7th International Conference on PErvasive Technologies Related to Assistive Environments is organized by the University of Texas at Arlington, USA.

The workshop title is "Assistive Technologies For Safe Operation Of Complex Technological Systems Including Industrial Sites, Shipping, Off-Shore Platforms And Mining Activities".

This workshop will include papers/presentations on: a) Technologies that monitor normal and emergency conditions in complex systems, b)recognition of critical system parameters, c) operators training systems, d) human and environmental risk assessment tools, e) computer aided systems on emergency response and rescue, d) depiction of human factors involved in safe operation, f) IT methodologies for the siting of hazardous installations, g) tools for the communication of risk, h) aiding of competent authorities in applying legal aspects and any other related to the above topic.

Topics in this workshop include: Technologies to monitor normal and emergency conditions in these systems, training systems, human and environmental risk assessment, emergency response and rescue systems, human factors involved in safe operation, siting of hazardous installations, communication of risk, legal aspects and many other related topics.

Important dates

Abstract Submission Deadline extended: **February 20, 2014**

March 20, 2014 - Paper Submission Deadline
April 06, 2014 - Paper Acceptance Notification
April 20, 2014 - Camera Ready Paper Deadline

Submission Information

Abstracts of 500 words are due for Feb. 10. Please email abstracts to Dr. Zoe Nivolianitou (zoe[at]ipta.demokritos.gr).

Submissions are to be done through the workshop's submissions page.

33rd International Conference on Offshore Mechanics and Arctic Engineering (OMAE 2014) Structures Safety and Reliability Symposium

San Francisco,CA,USA
8-13 June, 2014

Coordinator: Carlos Guedes Soares

Important dates

September 30, 2013 - Abstract Submission
October 21, 2013 - Abstract Acceptance
January 6, 2014 – Submission of Full-Length draft paper to review
January 27, 2014 – Notification of Paper Acceptance
March 16, 2014 – Submission of Final Paper

Conference Website: http://www.omae2014.com

10th International Conference on Digital Technologies 2014

Zilina – Slovak Republic
9-11 July, 2014

The Tenth International Conference DT 2014 is the annual event that is held in Žilina traditionally. The aim of the conference is to bring together researches, developers, teachers from academy as well as industry working in all areas of digital technologies. The conference makes is focused on a wide range of applications of computer systems. Topics of interest include:

- Reliability analysis and risk estimation
- Testing and fault-tolerant systems
- Accident and incident investigation
- Human factor
- Risk and hazard analysis
- Software reliability

The two Workshops in framework of the conference will be organized:

- International Workshop on Biomedical Technologies
- International Workshop on Reliability Technologies

Important dates

31 March, 2014 - Full paper submission
5 May, 2014 - Paper acceptance notification
30 May, 2014 - Camera-ready papers
30 June, 2014 - Final program

All submitted papers will be reviewed by Program Committee members. Accepted papers will be published in conference proceedings (CD-version under an ISBN reference).

Secretariat

DT'2014 Organizing Committee
Department of Informatics / University of Zilina
Univerzitna 1, 01026, Zilina, Slovakia
dt@fri.uniza.sk

Conference Website: http://dt.fri.uniza.sk

23rd International Conference Nuclear Energy for New Europe

Portorož, Slovenia,
September 8-11, 2014

Coordinator: Igor Jencic

Important dates

April 30, 2014 - Abstract Submission
June 21, 2014 - Abstract Acceptance
August, 2014 – Submission of Full-Length paper

Conference Website: http://www.nss.si/nene2014

7th International Conference Workingonsafety.net Learning from the past to shape a safer future

Scotland, UK,
30 September – 03 October 2014

Workingonsafety.net is an international network of decision-makers, researchers and professionals responsible for the prevention of accidents at work. The network attracts researchers, regulators, inspection bodies, safety professionals and other experts in this field of research and policy-making. It consists of an Internet platform (www.workingonsafety.net) and a biennial conference).

The organizing committee of the 7th conference invite to Scotland, United Kingdom. The hosting organization is the Institution of Occupational Safety and Health (IOSH), based in Leicestershire, England. Abstracts should be submitted electronically through the conference website, www.wos2014.net.

Important dates

January 31, 2014 – Abstract Submission
Mid March, 2014 - Notification of Acceptance
June 15, 2014 - Full Paper Submission and end of early registration
August 31, 2014 – Deadline for the receipt of presentations

Secretariat
WOS Administrative Secretariat and National Organising Committee
Institution of Occupational Safety and Health
The Grange, Highfield Drive, Wigston, Leicestershire LE18 1NN, UK
Tel: +44 (0) 116 257 3378
mail: info@wos2014.net

Conference Website: www.wos2014.net

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

1.3 Companies

- TAMROCK Voest Alpine, Austria
- IDA Kobenhavn, Denmark
- VTT Industrial Systems, Finland
- Bureau Veritas, France
- INRS, France
- Total, France
- Commissariat á l'Energie Atomique, France
- DNV, France
- Eurocopter Deutschland GMbH, Germany
- GRS, Germany
- SICURO, Greece
- VEIKI Inst. Electric Power Res. Co., Hungary
- Autostrade, S.p.A, Italy
- D'Appolonia, S.p.A, Italy
- IB Informatica, Italy
- RINA, Italy
- TECSA, SpA, Italy
- TNO Defence Research, The Netherlands
- Dovre Safetec Nordic AS, Norway
- PRIO, Norway
- SINTEF Industrial Management, Norway
- Central Mining Institute, Poland
- Adubos de Portugal, Portugal
- Transgás - Sociedade Portuguesa de Gás Natural, Portugal
- Cia. Portuguesa de Producção Electrica, Portugal
- Siemens SA Power, Portugal
- ESM Res. Inst. Safety & Human Factors, Spain
- IDEKO Technology Centre, Spain
- TECNUN, Spain
- TEKNIKER, Spain
- CSIC, Spain
- HSE - Health & Safety Executive, UK
- Atkins Rails, UK
- W.S. Atkins, UK
- Railway Safety, UK
- Vega Systems, UK

1.4 Educational and Research Institutions

- University of Innsbruck, Austria

- University of Natural Resources & Applied Life Sciences, Austria
- AIT Austrian Institute of Techn. GmbH, Austria
- Université Libre de Bruxelles, Belgium
- University of Mining and Geology, Bulgaria
- Czech Technical Univ. in Prague, Czech Republic
- Technical University of Ostrava, Czech Republic
- University of Defence, Czech Republic
- Tallin Technical University, Estonia
- Helsinki University of Technology, Finland
- École de Mines de Nantes, France
- Université Henri Poincaré (UHP), France
- Laboratoire d'Analyse et d'Architecture des Systèmes (LAAS), France
- Université de Bordeaux, France
- Université de Technologie de Troyes, France
- Université de Marne-la-Vallée, France
- INERIS, France
- Fern University, Germany
- Technische Universität Muenchen, Germany
- Technische Universität Wuppertal, Germany
- University of Kassel, Germany
- TU Braunschweig, Germany
- Institute of Nuclear Technology Radiation Protection, Greece
- University of the Aegean, Greece
- Universita di Bologna (DICMA), Italy
- Politecnico di Milano, Italy
- Politecnico di Torino, Italy
- Universita Degli Studi di Pavia, Italy
- Universita Degli Studi di Pisa, Italy
- Technical University of Delft, The Netherlands
- Institute for Energy Technology, Norway
- Norwegian Univ. Science & Technology, Norway
- University of Stavanger, Norway
- Technical University of Gdansk, Poland
- Gdynia Maritime Academy, Poland
- Institute of Fundamental Techn. Research, Poland
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- University Politechnica of Bucharest, Romania
- University of Iasi, Romania
- Slovak Academy of Sciences, Slovakia
- University of Trencin, Slovakia
- Institute "Jozef Stefan", Slovenia
- Asociación Española para la Calidad, Spain
- PMM Institute for Learning, Spain
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- Universidad Politecnica de Valencia, Spain
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- University of Castilla-La Mancha, Spain
- LuleåUniversity, Sweden
- World Maritime University, Sweden
- Institut f. Energietechnik (ETH), Switzerland
- Paul Scherrer Institut, Switzerland
- City University London, UK
- Liverpool John Moores University, UK
- University of Aberdeen, UK
- University of Bradford, UK
- University of Salford, UK
- University of Strathclyde, Scotland, UK

1.5 Associate Members

- Federal University of Pernambuco, Brazil
- Fluminense Federal University, Brazil
- Pontifícia Universidade Católica, Brazil
- European Commission - DR TREN (Transport and Energy), in Luxembourg
- Vestel Electronics Co., Turkey

2 ESRA Officers

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Chairmen of the Standing Committees
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C. Guedes Soares, Instituto Superior Técnico, Portugal

3 Standing Committees

3.1 Conference Standing Committee

Chairman: A. Grall, University of Tech. of Troyes**,** France

The aim of this committee is to establish the general policy and format for the ESREL Conferences, building on the experience of past conferences, and to support the preparation of ongoing conferences. The members are one leading organiser in each of the ESREL Conferences.

3.2 Publications Standing Committee

Chairman: C. Guedes Soares, Instituto Sup. Técnico, Portugal

This committee has the responsibility of interfacing with Publishers for the publication of Conference and Workshop proceedings, of interfacing with Reliability Engineering and System Safety, the ESRA Technical Journal, and of producing the ESRA Newsletter.

4 Technical Committees

Technological Sectors

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Chairman: G. Sansavini, Italy
E-mail: Giovanni.Sansavini@mail.polimi.it

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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.
For application for membership of ESRA, please contact the general secretary Coen van Gulijk
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