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# NE•RS

## 2013

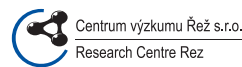
6<sup>th</sup> ANNUAL CONFERENCE ON NUCLEAR ENERGY

November 13, 2013

Prague, Kaiserstejn Palace, Malostranské náměstí 23



## PARTNERS



## MEDIA PARTNERS



## ADMINISTRATOR



NEW GENERATION NUCLEAR ENERGY PARTNERSHIP



- PRIORITY PLACED ON SAFETY
- INNOVATION POTENTIAL
- QUALITY OF EDUCATION

THREE PHENOMENA OF NUCLEAR ENERGY  
PUSHING DEVELOPMENT OF SOCIETY FORWARD

or  
are we able to utilize the unique strengths  
of nuclear power?





Dear colleagues,

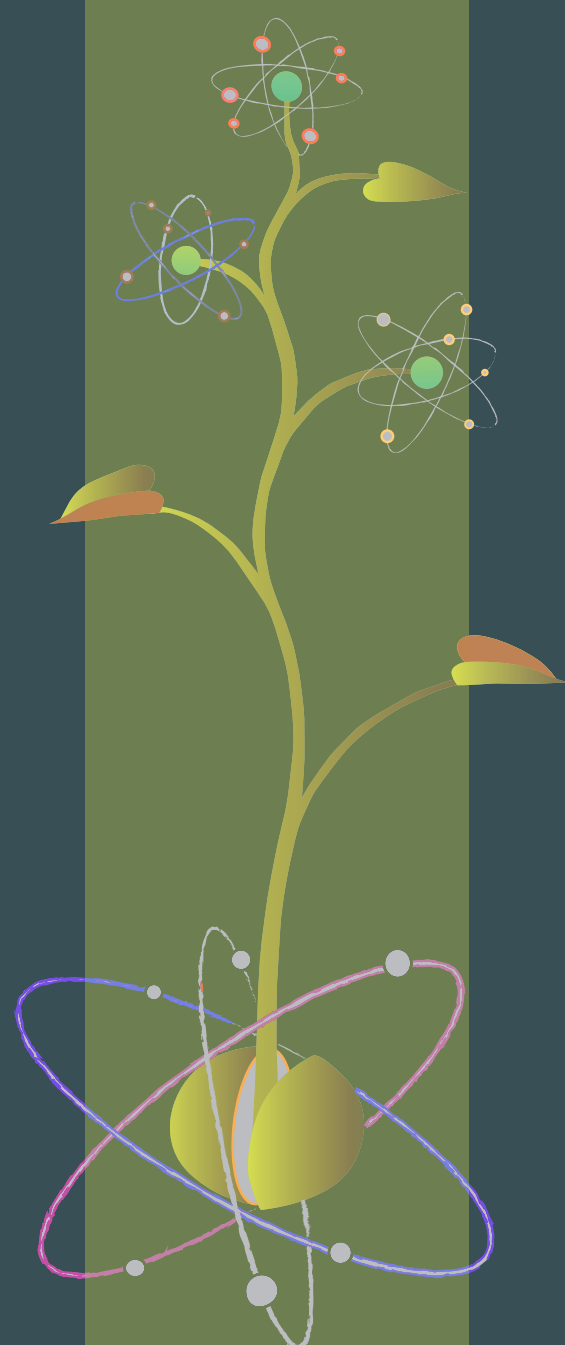
In recent years we are witnesses of such events and actions in the global energy situation they, in retrospect, cannot be called conceptual. Subsidies of renewables distort the energy market..., overestimated renaissance of nuclear energy..., shale gas boom (it's a bubble or not?)..., reluctance to clarify the carbon tax... – all of them discourage investors and makes our energy future hazy. Infrastructure guaranteeing safe and reliable supply of electricity, the development of society and economy cannot progress without, is very complicated, and investment cycle of power plants covers many decades. Uncertainty suppresses development.

Seems necessary to pay attention to nuclear power. It's hard to find a branch integrating three phenomena – the priority of safety, intensive development based on innovation and the need for the highest possible qualification. Nuclear power meets it. Nuclear power is exceptional. But – are we able to utilize its unique strengths? That is why we have prepared the program of today's conference as a response to all this. And that is what today's presentations and discussions have been about.

I believe that the NERS 2013 conference fulfilled your expectations, and we look forward to meeting you at the 7<sup>th</sup> Conference on Nuclear Energy – NERS 2014.

Jiří Marek  
NE•RS Chairman

Prague, November 13, 2013



# CONFERENCE PROGRAM

morning session

**Jiří MAREK** NERS Chairman

**conference opening**, welcome address and introduction of **Petr OTČENÁŠEK**, Session Chairman, and his essay on **“INTERACTIONS BETWEEN THEORETICAL, TECHNICAL AND SOCIAL SCIENCES AND NUCLEAR POWER”**

**Petr OTČENÁŠEK** Session Chairman



In 1962 he graduated from the Faculty of Applied and Nuclear Physics of the Czech Technical University, where he further obtained a Ph.D. and was appointed Associate Professor in Applied Nuclear Physics. The longest and most important part of his professional carrier he spent as a university lecturer and scientist; during the period of 1976 – 1980, he held the position of the Chair of the Applied Nuclear Physics Dept. He is the author of approx. 200 publications (including 12 textbooks for university students). In parallel he has working as a consultant in a number of projects in the field of nuclear technologies and energy strategies for Czech and foreign institutions, bodies and companies. He was a member of the Governmental Independent Energy Commission, which creates the basis for the actual energy strategy of the Czech Republic.





**Aleš LACIOK** Head of Research and Development, ČEZ, a.s.

**Petr ZÁVODSKÝ** Director of the Department of Nuclear Power Plant Construction, ČEZ, a.s.

## INDISPENSABLE ROLE OF NUCLEAR POWER AND NUCLEAR DEVELOPMENT IN DEVELOPING ADVANCED TECHNOLOGIES AND PROCESSES



Aleš LACIOK graduated from the Faculty of Science, Charles University in Prague (1991) and completed MBA studies at Sheffield Hallam University in 2006. In the years 1994 – 2006 he worked in NRI Řež, primarily in the area of development systems and technologies of radioactive waste management, risk and safety analyses, and fuel cycle analyses (including assessment of socio-economic aspects). He participated in the elaboration of the state concept of management of radioactive waste and spent nuclear fuel. Since early 2007 he joined ČEZ, plc, where is currently responsible for research and development. He has experience in international projects (EU Framework Programme for Research, IAEA, OECD NEA). He is Chairman of the Executive Committee of the Technological Platform “Sustainable Energy” and a member of the Executive Committee of NUGENIA (Nuclear Generation Association).

*Petr ZÁVODSKÝ is a graduate from the Faculty Electrical Engineering of the University of Transport and Communications in Žilina. Since 1994 he has worked in ČEZ power company, he started in Temelín Nuclear Power Plant where held several positions in the construction of the first two units, including a project manager of independent verification and validation of security systems software. In September 2006, he moved to the new group for Analysis of the construction of a new nuclear power plant. Since April 2009 he is the Director of the Department of Nuclear Power Plant Construction. In the last two years, was also a member of the Board of ČEZ Bohunice and JESS (Slovak Nuclear Power Company).*

## NUCLEAR TECHNOLOGIES AND SUSTAINABLE ENERGY



**Martin RUŠČÁK** Director, Research Centre Řež, s.r.o.

Graduated in 1985 at Faculty of Physical and Nuclear Engineering, Czech Technical University, he finished his doctoral studies in 1991 at West Bohemian University and reached his MBA from Sheffield Halam University (2001). He worked in nineties in the Nuclear Research Institute in Řež as a team leader for corrosion and microstructural studies focused at ageing management of NPP components. He implemented methodology of evaluation of flow accelerated corrosion for secondary circuits and was responsible for managing projects for CEZ and EPRI in the area of evaluation of reactor internals and coordinated development of experimental facilities. Since 2000 he spent 10 years in Det Norske Veritas, being responsible for the Czech and Slovak units and later in Norway and in the UK was taking responsibility for project development and project management in the nuclear and fossil energy areas as a project director. Since February 2011 he is the director of Research Centre Řež.

## FIRST RATE EDUCATION SYSTEM AS A REFLECTION OF THE STRICT REQUIREMENTS OF NUCLEAR POWER AND NUCLEAR SCIENCE



**František HRDLIČKA** Dean of the Faculty of Mechanical Engineering, Czech Technical University in Prague

Graduated from the Faculty of Mechanical Engineering, Czech Technical University in Prague, Department of Energy Engineering, with specialization on steam boilers (1969). After graduating, he joined the Strojtex Dvůr Králové, Technical Assistance Centre to Ministry of Industry. Since 1976 he connected his career with the Faculty of Mechanical Engineering in Prague, gradually as a researcher and lecturer at the Institute of Fluid Mechanics and Energy, Deputy Head of Department, Head of Laboratory and Head of Department of the Thermal and Nuclear Power Plants. In the years 2004 – 2006 he was Vice-Rector of the Czech Technical University in Prague for education and since 2006 has been Dean of the Faculty of Mechanical Engineering. In 1985 he was appointed as authorized expert in the field of power and energy. He was one of the founders of the Czech Chamber of Certified Technicians and Engineers, where he currently acts as Vice Chairman. Since 1994 he is a member of ASME (USA). F. Hrdlička acts as a representative of the Czech Technical University in Czech Committee FEANI, further is a member of the FBC Committee of the International Energy Agency, chairman of the supervisory board of TEPLOTECHNA OMEGA, member of the Independent Energy Commission (NEK) appointed by the Government in 2007, of the Scientific Council VGB, of the EON Energy ČR Advisory Committee, and also member of scientific councils of three faculties of mechanical engineering (Technical University of Ostrava, Slovak Technical University in Bratislava and Technical University in Košice).

**coffee break devoted to student presentations and posters**



**Students of Czech universities under the guidance of CENEN (Czech Nuclear Education Network) will presented, discussed and defended their work, findings, essays, information, analyses, etc., reflecting the topic of the NERS Conference.**

**Poster session was opened throughout the conference on the first floor of the Kaiserstejn Palace**

**student session guidance:**

Václav DOSTÁL | Department of Energy, Faculty of Mechanical Engineering, Czech Technical University in Prague, Vice-President of CENEN)

Karel KATOVSKÝ | Department of Electrical Power, Faculty of Electrical Engineering and Communication, Brno University of Technology, CENEN

**welcoming essay:**

Tomáš ČECHÁK | Chair of the Department of Dosimetry, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague





## INNOVATIVE CAPABILITY OF NUCLEAR TECHNOLOGIES – CREATING BENEFITS WORLDWIDE



**Tatiana SALNIKOVA** Manager VGB Activities and Technical Specialist, AREVA GmbH

Tatiana Salnikova got her pre-degree at Moscow Power Engineering Institute in Environmental Engineering, followed by the Bachelor and Diploma with a major in Nuclear Engineering at the University of Applied Sciences Zittau/Görlitz with a full time scholarship from Saxon State Ministry of Science and Culture. Afterwards she obtained a PhD in mechanical engineering at the Dresden University of Technology in cooperation with AREVA GmbH in the field of the Fuel Assembly Design for PWR. In 2007 she joined the AREVA Germany, Engineering Activities as a Project Manager for the German Utilities (VGB), where she is in charge of the development of the statistical LBLOCA methodology for German LWRs, supported by VGB-Group “Verification of fuel reloading”. Since 2010 Tatiana Salnikova is working on the core aspects of the Load following capability of NPPs, participating at the IAEA working group “Load following operation mode in NPPs” as an invited consultant. She is also a member of the steering committee of the German nuclear society section “Reactor safety”, and is organizing the topical section “Fukushima 3 years later” at the Annual meeting on Nuclear Technology this year.

## TECHNOLOGICAL AND TECHNICAL BENEFITS OF NUCLEAR FUSION RESEARCH AND DEVELOPMENT – ARE WE ABLE TO UTILIZE THEM?



**Milan ŘÍPA** Scientific Information and Popularization, Institute of Plasma Physics, Academy of Sciences of the Czech Republic

Graduated from the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague (1971). His dissertation in the field of experimental plasma physics was completed at the Institute of Plasma Physics in Prague. At the Institute, he was working on passive and active optical diagnostics of pulsed plasma systems; now he is heading the Department of Scientific and Technical Information and Popularization. For fifteen years, he has been organizing the Open Days at the Institute, delivered more than 90 lectures on thermonuclear fusion for high school students and general public. He has authored more than 200 popularization articles, has been the editor and co-author of four issues of the book “Controlled Thermonuclear Fusion for Everyone”. He has contributed to the translation of the book “Fusion – Energy of the Universe”. He has developed and patented a unique didactic tool – a Tokamak construction kit. Milan Řípa is a member of Public Information Network, a group within the European Fusion Development Agreement that focuses on popularization of controlled fusion in Europe. He lectures at the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, and Faculty of Physical Education and Sport, Charles University. Milan Řípa holds the Czech State Award for Bravery. He was awarded three times by the Czech Physics Society for “long-standing popularization of controlled thermonuclear fusion”.

## PAST AND FUTURE OF NUCLEAR POWER CONCEPTS AND TRANSFORMATION OF INNOVATIONS AND EXPERIENCE



**Howard BRUSCHI** Executive Consultant, Westinghouse Electric Company

Mr. Bruschi is an Executive Consultant on matters of advanced nuclear plant strategy, design, licensing, business development, communication, and project implementation. He received a bachelor and master of electrical engineering from Cornell University in 1964, and holds a master of business administration from the University of Pittsburgh, awarded in 1968, and completed the Executive Program for Management Development at the Harvard Business School in 1976.

Mr. Bruschi retired from Westinghouse Electric Company from the position of Senior Vice President and Chief Technology Officer in 2002. His responsibilities included the technology, development, commercialization, and project execution of major nuclear projects for Westinghouse. A key achievement was Mr. Bruschi's leadership in obtaining design certification for the AP600 from the U.S. Nuclear Regulatory Commission in 1998, becoming the world's first nuclear passive plant design to be approved by a regulatory authority. This was followed by the AP1000 nuclear plant design for which contracts have been signed for ten plants – four in China, presently under construction, and six in the U.S. (the first in 30 years), four of which are under construction. Previously he was Project Manager for Westinghouse of Brazil's Angra nuclear project. He directed the engineering, procurement, and component delivery for the nuclear steam supply system of that country's first nuclear power plant, and also was the executive responsible for joint research and development between Westinghouse and French nuclear industry organizations.

Mr. Bruschi was elected to the U.S. National Academy of Engineering in 2008 and inducted into the U.K. Royal Academy of Engineering in 2010. He is a member of the American Nuclear Society, and is the recipient of the Society's Walter H. Zinn Award for outstanding contributions and leadership in advancing the nuclear power industry. He is a visiting professor at China's SNPTC University, and is the recipient of the first ever Westinghouse Lifetime Achievement Award.





## afternoon session

Ceremonial launch of the publication **“SAFETY – IMPERATIVE OF NUCLEAR ENERGY”**, issued on the occasion of the 6<sup>th</sup> NERS 2013 Annual Conference with **Dana Drábová** as patron and key author. She introduced the basic thesis of the brochure and chaired an expert panel discussion.

### **Jiří MAREK** Chairman, Chairman of the Afternoon Session

He is the consultant in the field of power industry and is the Head Executive of JMM Consulting, Ltd. – a company focused on advisory services and organization of professional activities. After graduating from the Czech Technical University, Faculty of Technical and Nuclear Physics, he worked in research; he has been working in the power industry field since 1974 (until 1996 in ČEZ). For the last twenty years, he was the advisor of the Minister of Industry and Trade, chairman and vice-chairman of the Supervisory Board of ČEZ, a member of supervisory boards in several energy distribution companies and an advisor of Deputy Ministers of Finance. In these positions, he was dealing with the reorganization of state administration in power industry, the development of state energy policy, the establishment of the State Office for Nuclear Safety and with the preparation of the privatization of Czech power industry. He is occupied by publication activities, mainly in the field of nuclear power industry and has wide experience in organizing of international and specialized professional conferences and meetings. His positions are quoted on TV, radio and in economic periodicals.

### **Dana DRÁBOVÁ** Chairwoman of the State Office for Nuclear Safety

After graduating from the Faculty of Nuclear Science and Physical Engineering of the Czech Technical University in 1985 (where she also received scientific degree in 2002) she dealt with several topics in radiation protection field. Since May 1996 as Director she managed the National Radiation Protection Institute and on November 1999 was appointed Chairwoman of the State Office for Nuclear Safety. In connection with it she participated in a number of IAEA expert missions aimed on improving the regulatory framework for radiation protection and nuclear safety in developing countries, and has held various positions in the IAEA Board of Governors (Vice-President) and WENRA (President). Currently she acts as Chairperson of the IAEA Safety Standards Committee, participates at the work of the Advisory Committee for Nuclear Safety to the IAEA Director General, and is member of scientific councils of several technical universities and research bodies.



panel discussion participants (in alphabetical order):



**Frank CARRÉ** Scientific Director of the CEA Nuclear Energy Division

research and development in nuclear field – innovation and high quality safety standards with potential to be used in number of branches of human activities

Frank Carré joined CEA in 1976 and contributed through varied managerial positions to studies on advanced nuclear systems. From 2001 to 2009 he acted as Program Director for Future Nuclear Energy Systems and contributed to shape national R&D programs and international collaborations on fast neutron reactors with advanced fuel cycles and high temperature reactors for the cogeneration of process heat and hydrogen. Since August 2009 he is Scientific Director of CEA's Nuclear Energy Division and lecturing professor at the Ecole Polytechnique.



**František HEZOUČKÝ** consultant, former chief person for commissioning of all Czechoslovak and Czech NPPs

safety culture, technical measures for the principles of non-proliferation, interdisciplinary inspiration, institutionalization of security concepts and standards arising from the design and operation of nuclear power plants

He is a graduate of the Faculty of Mechanical Engineering at the Czech Technical University (specialization in thermal and power facilities) as well as at the Slovak Technical University (field of nuclear technique). He has long-term experience with commissioning of the nuclear power plants in Jaslovské Bohunice where he gradually held number of various positions from the Primary Circuit Operator up to Department of Operational Modes Head. In Dukovany Nuclear Power Plant he worked as the Chief Commissioning Engineer of all four units. During 1987 – 1993, he worked in the Temelín NPP as a Deputy Director for Operation Preparation and as a Deputy Director for Commissioning. In the following years he worked for Westinghouse as advisory engineer for Temelin completion project, and for consulting company Colenco, too. In January 1999, he was elected the Vice-Chairman of the Board of Directors of ČEZ, and on June 10, 1999, he became Managing Director of the Temelín NPP Construction Division. Under his leadership there has been a fundamental change in the timing of construction rate. After the Temelin NPP completion in April 2003 he left ČEZ to work for IAEA in Vienna as Senior Nuclear Engineer. Since the end of this mission he provides consulting services and holds lectures at several technical universities.





**Jiří HŮLKA** Deputy Director for R&D, National Radiation Protection Institute

risk optimization, transfer and reflection with medical disciplines, multi-barrier concepts in radiation protection – limits...

He received his M.Sc. in nuclear sciences and physical engineering in 1980 from the Czech Technical University in Prague. His whole professional career is connected within the National Radiation Protection Institute in Prague (NRPI) – he gradually engaged in monitoring of nuclear power plants, monitoring of high natural radioactivity in the buildings and coordinating the Radon Programme of the Czech Republic. Since the year 2000 he is responsible for research and development in the field of radiation protection. He focuses mainly on general issues of protection against ionizing radiation, modern methods of NPP monitoring and the impact of accidents on the environment, including impact of the Chernobyl accident. He is a member of Group of Experts referred to in Article 31 of the Euratom Treaty.



**Jan JOHN** Chairman, Nuclear Chemistry Department, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University

radioactive waste from “A to Z” – innovations, safety, protection of environment – inspiration for other branches

After graduating from Czech Technical University in Prague, Faculty of Nuclear Sciences, field of study in nuclear chemical engineering, he joined the maternity department, where he is today. After he completed his PhD Degree, he attended post-gradual studies at the Universities of Oslo and Trondheim in the years 1985 – 1986, and from 1987 – 1990 a working visit in the United Institute for Nuclear Research in Dubna. His main areas of research interest include the treatment of radioactive waste, separation methods, radioanalytical methods, nuclear spectroscopy, and monitoring and speciation of radionuclides in the environment. Since 2004, he participates in projects of the 6th and 7FP EU focused on the separation of minor actinides from high active liquid radioactive wastes for their subsequent transmutation. He is the author or coauthor of more than one hundred publications in scientific journals or conference proceedings and a member of the International Editorial Board of the Journal of Radioanalytical and Nuclear Chemistry. J. John is a Chairman of the Group of Experts in Nuclear Chemistry of the Czech Chemical Society and the Secretary of the Division of Nuclear and Radiochemistry at the European Association for Chemical and Molecular Science.



**Jukka LAAKSONEN** Vice-President, Rosatom Overseas and Vice Chair of INSAG

innovative perception of safety as phenomenon, selected safety aspects creating general benefit

After graduation from Helsinki Technical University (1972) he started his career in the Technical Research Centre of Finland. In 1974 he joined the Finnish nuclear regulatory body STUK where he held various posts and served as Director General from April 1997 to January 2012. During his whole career he has actively participated in international activities in the area of nuclear safety and safeguards in number of teams and positions (e.g. OECD/NEA, WENRA, IAEA Committee on Safety Standards ...), and acted as senior officer in the IAEA's OSART team, as visiting expert at US NRC and conducted numerous Expert Service missions by the IAEA and by the World Bank. Since April 2012 he works as Vice President of Rosatom Overseas in tasks related to promotion of nuclear safety development in Russia and licensing of exported Russian NPPs.



**Jozef MIŠÁK** Director of Strategy, ÚJV Řež, plc.

risk assessment, probabilistic models, safety standards for nuclear power plants, continuous process setting the benchmark for all other human activities

He graduated from the Czech Technical University in Prague, Faculty of Nuclear Sciences and Physical Engineering. His more than 40 years long performance in the field of nuclear power industry is focused on research and engineering support for safety principles implementation during design and operation of NPPs. He has long lasting experience from several leading positions in the field of nuclear safety. During 1971 – 1993 he worked in VUJE (NPP Research Institute). During 1993 – 1997 he was the first Chairman of Nuclear Regulatory Authority of Slovak Republic. Between 1997 and 2004 he was with IAEA in Vienna, where he worked in the field of elaboration of safety standards and guidelines for NPP accident analysis. At the present time he is the Director for strategy at the ÚJV Řež, a.s. (Nuclear Research Institute Řež).





# SOCIAL MEETING

on the occasion of the conference and the launching of the brochure "SAFETY – IMPERATIVE OF NUCLEAR ENERGY".

Opportunity for informal discussion on the topics and challenges of the conference and communication with students of nuclear and technical branches based on their presentations and posters.







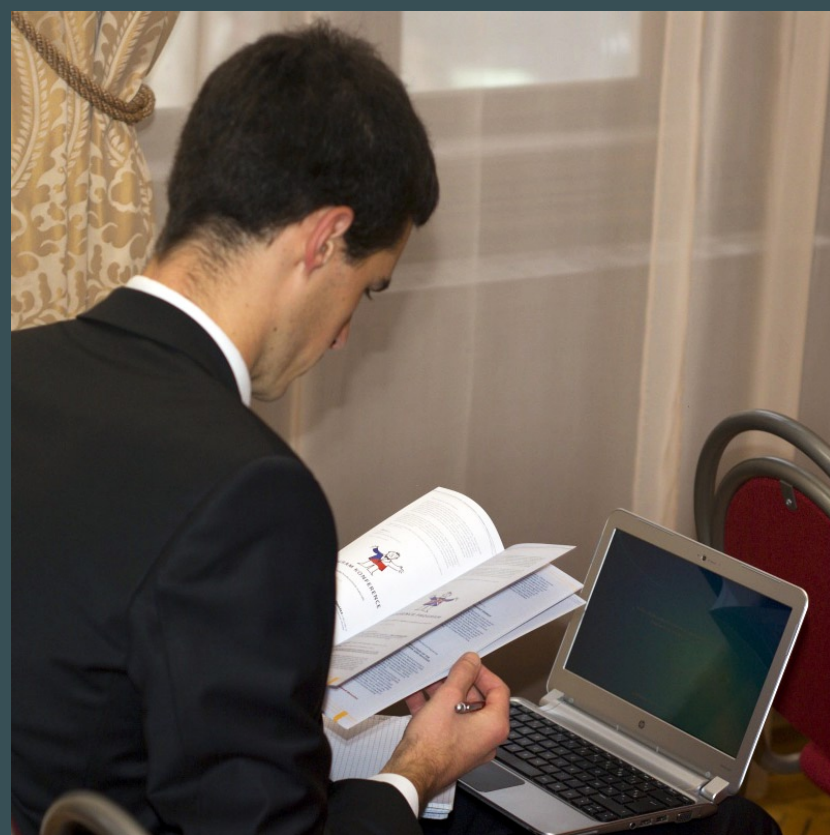




























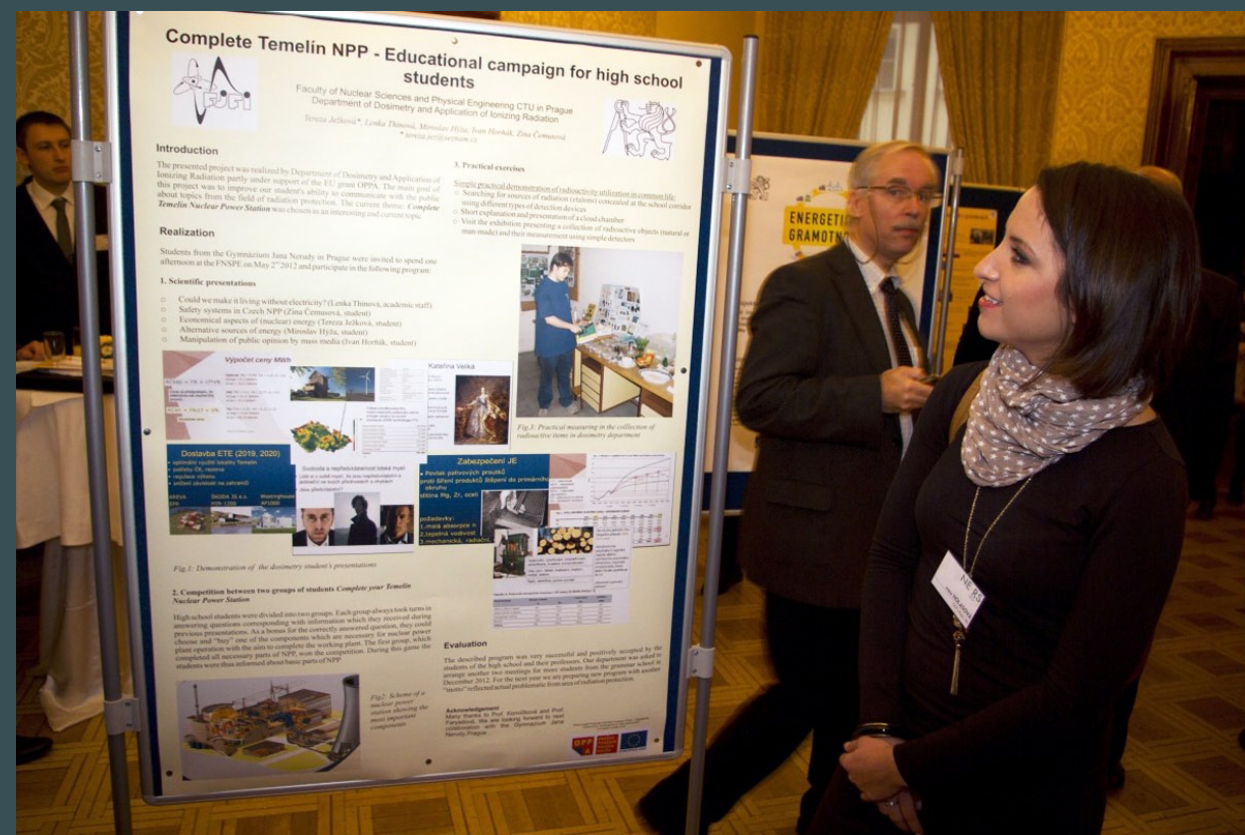




















































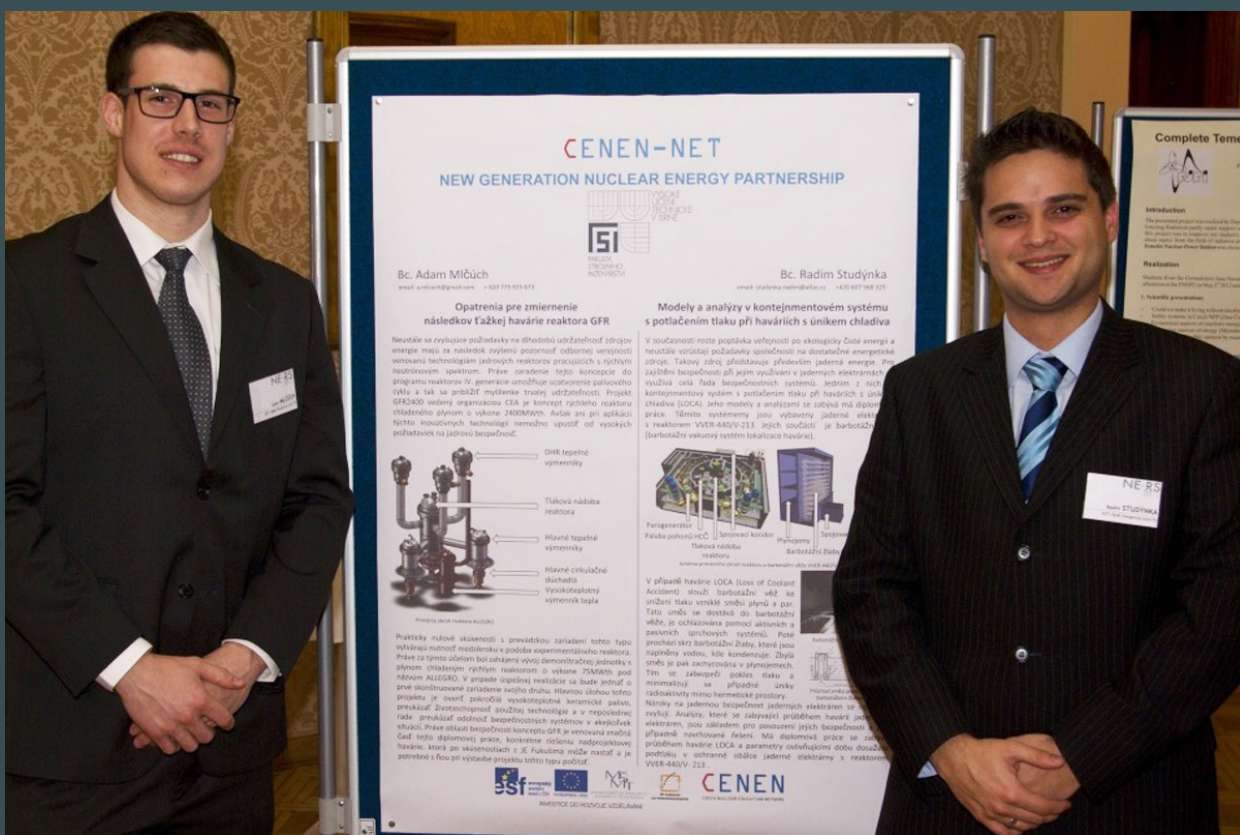




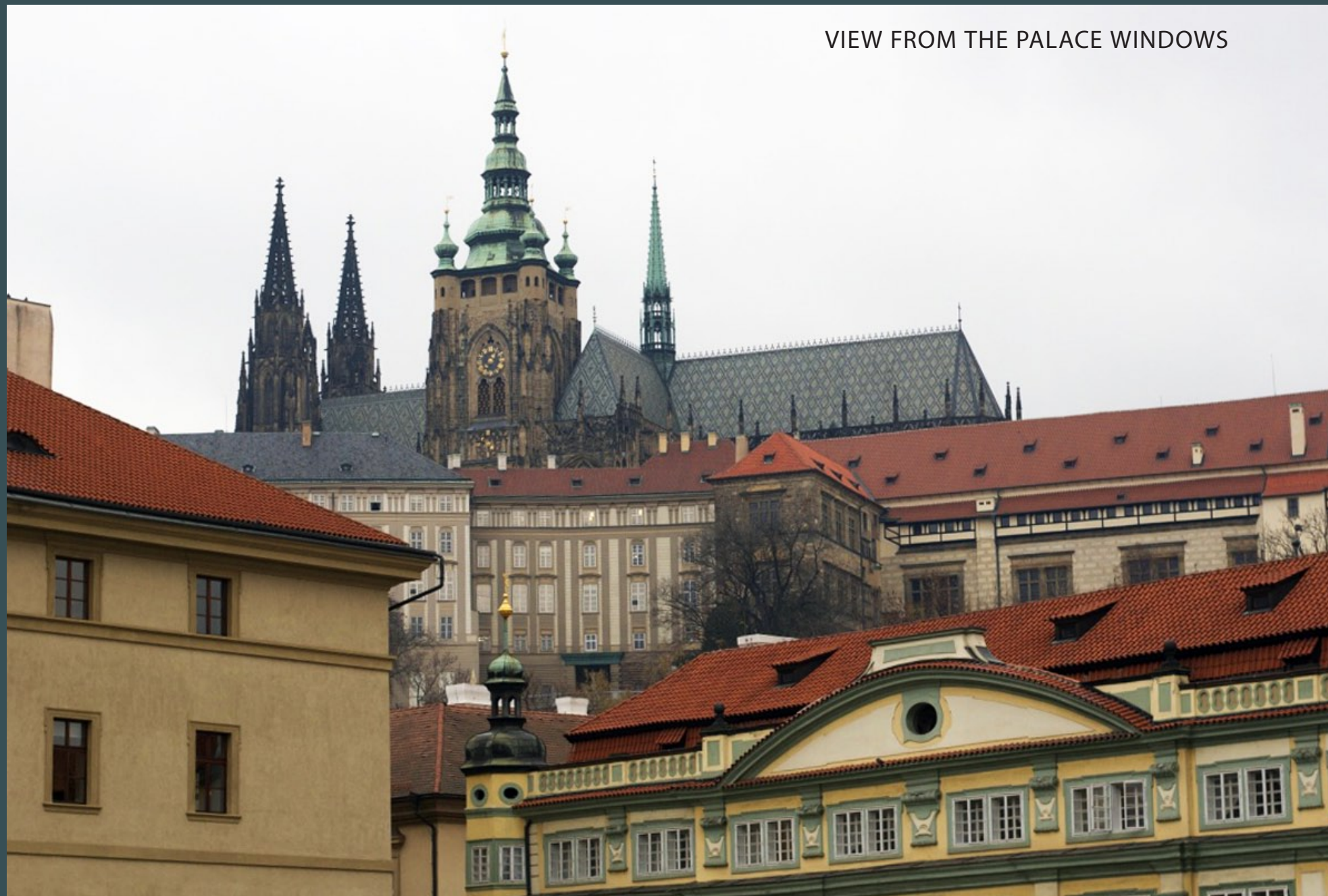










LOOKING FORWARD TO SEEING YOU AT THE **NERS 2014** CONFERENCE

## HISTORY OF KAISERSTEJNSKY PALACE

1699–1720 Baroque reconstruction initiated by Sir Kaiserstein but completed by Petr Radecký. 1859 Monument of marshal Radecký was built on the square. Until 1918 the square carried his name.

1866 Václav Petzold, a hotelier, buys the palace and opens an exclusive restaurant. For the next hundred years it is called „U Petzoldů“.

1904–8 Famous opera singer Emmy Destinn, a partner of Enrico Caruso, rents an apartment here.

1977 Total reconstruction begins under the architects Zdeněk Pokorný and Jaroslav Bělský.

1981 The palace is registered as a UNESCO heritage site.

1997 Restitution procedures are completed and the palace is returned to its original owners.

<http://www.kaiserstejnskipalac.cz/Text/uvodni-stranka?MenuItemId=1>