



## 10<sup>th</sup> International School on Nuclear Power

# PROGRAM

**26-29 November 2018 • WARSAW**

# SCHEDULE

26 <sup>th</sup> November Monday	27 <sup>th</sup> November Tuesday	28 <sup>th</sup> November Wednesday	29 <sup>th</sup> November Thursday
<b>WORKSHOPS</b> 1. National Center for Nuclear Research & Radioactive Waste Management Plant in Swierk 2. National Radioactive Waste Repository in Rozan  Details page 5-7	<b>Main Session</b>  <b>LECTURES</b>   Details page 2-3	<b>Main Session</b>  <b>LECTURES</b>   Details page 3-4	<b>WORKSHOPS</b> 1. National Center for Nuclear Research & Radioactive Waste Management Plant in Swierk 2. National Radioactive Waste Repository in Rozan  Details page 5-7
<b>Organizer:</b> National Centre for Nuclear Research Division of Radioactive Waste Disposal	<b>Organizers:</b> Ministry of Energy National Centre for Nuclear Research University of Warsaw, Faculty of Physics		<b>Organizer:</b> National Centre for Nuclear Research Division of Radioactive Waste Disposal

## Main Session - Lectures

### 27<sup>th</sup> November 2018 – Tuesday

Place: University of Warsaw, ul. Pasteura 5, building of the Faculty of Physics room 0.03

After every lecture 5 minutes are provided for questions and discussion

08:00-09:00	<i>Registration of participants</i>
09:00-09:15	<b>School opening</b> Dr. Józef Sobolewski, Director of Nuclear Energy Department, Ministry of Energy, Poland Prof. Andrzej Strupczewski, Conference Chairman, National Centre for Nuclear Research, Poland Prof. Dariusz Wasik, Ph.D., Dean of the Faculty of Physics, University of Warsaw, Poland
<b>POLISH NUCLEAR ENERGY PROGRAM</b> Session Leader: Mr. Artur Wdowczyk, Director General Polish Atomic Energy Agency, Poland	
09:15-09:35	<b>Status of Polish Nuclear Energy Program</b> Dr. Józef Sobolewski, Director, Nuclear Energy Department, Ministry of Energy, Poland
09:40-10:00	<b>Program of first nuclear power plant construction in Poland</b> Mr. Krzysztof Sadłowski, Chairman, PGE EJ 1, Poland
10:05-10:30	<b>Cooperation of the nuclear power plant with electric power system</b> Mr. Zbigniew Uszyński, Head of Dept of System Development, PSE S.A., Poland

10:35-11:00	<b>Radiological aspects of Rozan radioactive waste repository operation</b> Ms. Aneta Korczyc, Deputy Director, Division of Radioactive Waste Disposal, Poland
<b>11:05-11.30 Coffee break</b>	
<b>OVERCOMING HURDLES ON THE ROAD TO NUCLEAR POWER DEVELOPMENT</b> Session leader: Dr. Józef Sobolewski, Director of Nuclear Energy Department, Ministry of Energy, Poland	
11:30-12:10	<b>Energy Transition and 3E Challenges for Japan</b> Ms. Yukari Niwa Yamashita, Board Member, Director, The Institute of Energy Economics, Japan (IEEJ), Japan
12:15-12:55	<b>Why nuclear power is a necessary element of energy mix in EU countries</b> Dr. Andrei Goicea, Executive manager, FORATOM, Belgium
<b>13:00-13:45 Lunch</b>	
<b>NUCLEAR POWER AND CLIMATE</b> Session leader: Prof. Marta Kicińska-Habior, Ph.D., Faculty of Physics, University of Warsaw, Poland	
13:45-14:25	<b>Essential Role of Nuclear Power for Reduction of Greenhouse Gas Emissions</b> Dr. Józef Misak, Nuclear Regulatory Authority UJV, Czechia
14:30-15:10	<b>Can the objectives of Energiewende be achieved?</b> Prof. Alfred Voss, former director of Institute of Energy Economics and Rational Energy Use, Universität Stuttgart, Germany
<b>15:15-15.40 Coffee break</b>	
<b>RADIATION PROTECTION</b> Session leader: Dr. Paweł Krajewski, Director of Central Laboratory for Radiological Protection, Poland	
15:40-16:20	<b>How studies in High Background Radiation Areas contradict the linear nonthreshold (LNT) model?</b> Dr. SMJ. Mortazavi, University of Wisconsin, Milwaukee, USA
16:25-17:05	<b>Radiation monitoring in the vicinity of NPP Mochovce and the way of communication with local society</b> Mr. Pavol Chylý, Head of Mochovce NPP Radiation Protection Dept. Slovak Rep.
17:10-17:45	<b>The influence of NPP on local population</b> Prof. Waclaw Gudowski, KTH Royal Institute of Technology, Sweden
17:45	<b>The end of session</b>

**28<sup>th</sup> November 2018 – Wednesday**

Place: University of Warsaw, ul. Pasteura 5, building of the Faculty of Physics room 0.03

*After every lecture 5 minutes are provided for questions and discussion*

<b>MAIN ACHIEVEMENTS OF NUCLEAR POWER TODAY</b> Session leader: Mr. Władysław Kielbasa, PGE EJ 1 Sp. z o.o., Poland	
09:00-09:40	<b>Progress of EPR projects in China, France and Finland and application of lessons learned in EPR construction</b> Mr. Bruno Blotas, M.Sc., EDF, France

09:45-10:25	<b>ABWR Proven Construction Experience (Polish Supply Chain Participation)</b> Mr. Kimiharu Onda & Mr. Dale Fennel, Hitachi-GE Nuclear Energy, Japan & USA
<b>10:30-11:00 Coffee break</b>	
11:00-11:40	<b>Nuclear power plant construction with APR1400 reactors</b> Korea Hydro and Nuclear Power Corporation, Korea
11:45-12:25	<b>Perspectives and health effects of uranium mining</b> Prof. Andrzej Strupczewski, National Centre for Nuclear Research, Poland
<b>12:30-13:15 Lunch</b>	
<b>NEW NUCLEAR TECHNOLOGIES</b> Session leader: Prof. Mariusz Dąbrowski, National Center for Nuclear Research, Poland	
13:15-13:55	<b>High Temperature Experimental Reactor – the door to future industrial applications of HTRs</b> Ms. Eleonora Skrzypek, Senior Specialist, National Centre for Nuclear Research, Poland
14:00-14:40	<b>Features of HTGR and HTGR development in JAEA</b> Dr. Yoshitomo Inaba, Japan Atomic Energy Agency, Japan
14:45-15:10 Coffee break	
<b>EXPECTED CHANGES AFTER STARTUP OF THE FIRST NPP IN POLAND BASED ON EXPERIENCE IN OTHER COUNTRIES</b> Session leader: Dr. Michał Gryzinski, Director of Dept. of Operation of Nuclear Installations, National Center for Nuclear Research, Poland	
15:10-15:50	<b>Global energy scenarios of World Energy Council and role of nuclear power.</b> Dr. Stefan Hirschberg, Paul Scherrer Institute, Switzerland
15:55-16.35	<b>Power market policy and financing new nuclear power plants</b> Dr. Jerzy Majcher, Director of Power Division at Mott MacDonald, Poland
16.40-17:20	<b>Radiological events in Poland managed by CEZAR system</b> Mr. Karol Łyskawiński, Director, CEZAR, Polish Atomic Energy Agency, Poland
17:30	<b>The end of session</b>

# WORKSHOPS

## WORKSHOP N – Świerk Nuclear Centre

National Centre for Nuclear Research & Division of Radioactive Waste Disposal

26<sup>th</sup> November 2018 – Monday

29<sup>th</sup> November 2018 – Thursday

### Departure

08:00	<b>Departure from Warsaw to National Centre of Nuclear Research Świerk</b> Bus departures from Defilad Place near Science and Culture Palace at 08:00 Planned arrival to Nuclear Research Centre Świerk 08:45
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### DESCRIPTION

(1) **MARIA research reactor**, including Control Room, reactor pool within the containment and the reactor spent fuel pool with high activity fuel assemblies (110 min)

(2) **Division of Radioactive Waste Disposal** (105 min)

(3) **Education and training division** (45 min)

The goal and activity of the Division consist in propagation of nuclear science among the broadly understood society. The education is based on many demonstrations and experimental facilities. Laboratory of Atomic and Nuclear Physics is open inter alia for high-school students, and forms quite unique educational unit. The Division is visited annually by about 7000 visitors. We shall present our laboratory equipment (more than 30 experiments), model of HTR applications, educational environment of the MARIA reactor, as well as the exhibition of the nuclear waste treatment displaying many exhibits.

(4) **Radiation Protection Measurements Laboratory** (95 min)

#### A. Internal exposure monitoring – Whole Body Counter

The Whole Body Counter is a special equipment for the measurement of human body internal contamination with gamma emitters. It is used for internal exposure monitoring and allows to identify and assess the activity of all radionuclides in the human body. An example measurement will be performed during the exercise.

#### B. Internal exposure monitoring – Thyroid Counter

The Thyroid Counter is a special equipment for the activity measurement of radioactive iodine gathered in thyroid. It is used for internal exposure monitoring of people working with iodine unsealed sources. is performed. A calibration and an example measurement will be performed during the exercise.

#### C. External exposure monitoring

The dosimetric equipment used for the monitoring of external exposure for gamma radiation (ambient dose equivalent) will be presented during the exercise. An example measurement and methods of calibration will be performed.

#### D. Radiochemistry

The exercise includes the discussion of rules for determining the activity of alpha and beta emitters in urine samples. Such measurements are performed in order to assess doses from internal contamination with radionuclides. The rules of environmental samples (e.g. water, sewage, mules, soil, grass) sampling and preparation and measuring the activity of various radioactive isotopes in these samples.

## SCHEDULE

<b>08:00</b>	<b>Departure from Warsaw to National Centre of Nuclear Research Świerk</b> Bus departure from Defilad Place near Science and Culture Palace at 08:00 Planned arrival to Nuclear Research Centre Świerk 08:45			
	<b>GROUP 1</b>		<b>GROUP 2</b>	
<b>09:00-10:50</b>	<b>(1) MARIA reactor</b>		<b>09:00-10:50</b>	<b>(2) Division of Radioactive Waste Disposal</b>
<b>11:00-12:45</b>	<b>(2) Division of Radioactive Waste Disposal</b>		<b>11:00-12:45</b>	<b>(1) MARIA reactor</b>
<b>12:45-13:25</b>	<i>Lunch break</i>			
<b>13:25-14:10</b>	<b>(3) Education and training division Prof. Ludwik Dobrzynski lecture – Low radiation doses in medicine</b>			
<b>14:15-15:50</b>	<b>(4) Radiation Protection Measurements Laboratory</b> <ul style="list-style-type: none"> <li>• Internal exposure monitoring – Whole Body Counter</li> <li>• Internal exposure monitoring – Thyroid Counter</li> <li>• External exposure monitoring</li> <li>• Radiochemistry – in vitro and environmental monitoring</li> </ul>		<b>14:15-15:50</b>	<b>(4) Radiation Protection Measurements Laboratory</b> <ul style="list-style-type: none"> <li>• Internal exposure monitoring – Whole Body Counter</li> <li>• Internal exposure monitoring – Thyroid Counter</li> <li>• External exposure monitoring</li> <li>• Radiochemistry – in vitro and environmental monitoring</li> </ul>
<i>App. 15:50 Departure from National Centre for Nuclear Research</i>				

## WORKSHOP R – National Radioactive Waste Repository in Różan

**26<sup>th</sup> November 2018 – Monday**

**29<sup>th</sup> November 2018 – Thursday**

### DESCRIPTION

The storage of waste and transporting of waste to the storage facility is dealt with by a specialized institution, called the Radioactive Waste Management Plant (RWMP [ZUOP]), a State-owned public benefit corporation. RWMP is responsible for proper handling of radioactive waste since the moment the waste is taken over from the producer. RWMP is also the operator and user of the National Radioactive Waste Repository (NRWP). NRWP is situated in the locality of Różan on the Narew River, approx. 90 km off Warsaw, within a former military fort site, occupying an area of 3.045 ha. In operation since 1961, the NRWP is a surface storage facility, according to the IAEA classification.

**SCHEDULE**

08:00	<b>Departure from Warsaw to National Radioactive Waste Repository in Rozan</b> Bus departures from Defilad Place near Science and Culture Palace at 08:00 Planned arrival to Nuclear Research Centre Świerk 09:30
09:45-12:30	<b>Technical visit in National Radioactive Waste Repository</b>
13:00-14:00	<i>Lunch break</i>
App. 14:00 <i>Departure to Warsaw</i>	

**Place of bus  
departure for  
workshops held in  
Świerk and Różan**

