



## 3rd ENA workshop

*Istituto Superiore di Sanità  
Rome 15-17 May 2024*

## Scientific Program

### Wednesday 15<sup>th</sup> May

8:30–9:30	Registration
9:30–9:45	Welcome from ENA (R. Wieggers), AIRP (F. Mancini), ISS (F.Bochicchio)
9:45–9:50	Short Introduction from C. Nuccetelli
9:50–10:20	<b>Invited speaker: B. Okyar</b> <i>ISEMIR-N platform and Intercomparison Exercise on NORM analysis (preliminary results)</i>

#### Session I: Circular economy/reuse & recycling of NORM residues

10:20–10:40	<i>Critical raw materials; European perspectives and solutions including environmental impact.</i> <b>R. Wieggers</b>
10:40–11:00	<i>Bridging barriers to enable recycling of phosphogypsum in alternative cementitious binders.</i> <b>W. Schroeyers</b>
<b>11:00–11:30</b>	<b>Coffee break</b>
11:30–11:50	<i>An approach to NORM treatment based on solutions developed for industrial waste.</i> <b>B. Michalik</b>
11:50–12:10	<i>Lessons learned from the START houses: A case study in utilizing NORM residues in the circular economy.</i> <b>K.N. Rovenska</b>
12:10–12:30	<i>Concrete Made with NORM-Contained By-Products: Stakeholders' Perception in Three European Countries.</i> <b>N. Love</b>
12:30–12:50	<i>From Mining Waste to Valuable Resource: the approach of the Research Fund for Coal and Steel project MINRESCUE for a circular economy approach to Coal Mine Waste Geomaterials.</i> <b>L. Ferrara</b>
12:50–13:10	<i>Radioactivity reduction for NORM Phosphogypsum Byproduct of Phosphate Fertilizer Industry.</i> <b>M. Essakhraoui</b>

#### **13:10–14:00** LUNCH

#### Session II: Regulatory approach

14:00–14:30	<b>Invited speaker H. Fonseca,</b>
14:30–14:50	<i>Managing NORM residues: Application of a framework to support the decision-making process.</i> <b>N. Impens</b>
14:50–15:10	<i>Gamma radiation emitted by building materials – towards a regulatory framework in France.</i> <b>A. Cordelle</b>
15:10–15:30	<i>Elimination of NORM-waste in Switzerland: A new national directive.</i> <b>R. Stroude</b>

#### **15:30–15:50** Coffee break

15:50–16:10	<i>Should trade unions be concerned about NORM?</i> <b>S. Pepin</b>
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16:10–16:30 *ENA SRA presentation.* **Govert De With**

16:30–17:30 **ENA General Assembly**

Thursday 16<sup>th</sup> May**SESSION III: European ALARA Network-EAN Session**

9:00–9:25	<i>Optimization of protection. The cornerstone of radiation protection. A view on the NORM industry.</i> <b>Fernand Vermeersch</b>
9:25–9:50	<i>Overview of the UK regulation on NORM and examples of application.</i> <b>Sharon Ely</b>
9:50–10:15	<i>Circular economy in the last quarter of XX century: a paradigmatic example in a NORM industry of South-West of Spain.</i> <b>Rafael García-Tenorio</b>
10:15–10:40	<i>Enhancing radiation protection practices: Optimization practices for NORM industries and legacy sites in Greece.</i> <b>Constantinos Potiriadis</b>

**10:40–11:05 Coffee break**

11:05–11:30	<i>NORM sample characterization: challenges for in situ gamma measurements.</i> <b>Rosella Rusconi</b>
11:30–11:55	<i>A graded approach to characterize the exposure critical scenarios in industries involving NORM.</i> <b>Ilaria Peroni</b>
11:55–12:20	<i>Handling of contaminated commodities in Austria &amp; current developments</i> <b>Susanne Friedreich</b>
12:20–12:45	<i>Research questions on NORM emerging from the RadoNorm project</i> <b>Laureline Fevrier</b>

**12:45–13:30 LUNCH****SESSION IV: Young Professionals**

13:30–13:50	<i>Use-stage Life Cycle Impact Assessment for NORM in a Room made of Bauxite Residue (BR) Containing Novel Building Materials.</i> <b>C. Özcan Kılcan</b>
13:50–14:10	<i>NORM Valorization using Oil Shale Ash and Basalt-Boron Fiber in Concrete – an Environmental Life Cycle Assessment.</i> <b>U.A. Reigo</b>
14:10–14:30	<i>Overview of decommissioning of a NORM legacy site from DCP production. Challenges and lessons learned.</i> <b>M. Płachciak</b>
14:30–14:50	<i>NORM in geothermal installations: Identification of radiological risks, their perception and communication.</i> <b>L. Pollet</b>

**14:50–15:15 Coffe break**

15:15–15:35	<i>Radon and its progeny migration in a natural gas extraction and treatment facility: In-situ characterization of Pb-210 - case study.</i> <b>G. Ciocari</b>
15:35–15:55	<i>Active measurement of Radon and Thoron indoors and in materials with high resolution alpha spectrometry.</i> <b>M. Javed</b>
15:55–16:55	Young Professional Poster presentations

**16:05–16:45 Poster presentations****16:45–19:00 Social program****19:30 Social dinner**

Friday 17<sup>th</sup> May**SESSION V—Radon and NORM**

9:00–9:30 **Invited speaker: S. Fontani**, *The new National NORM database*

9:30–9:50 *Measurement of the thoron exhalation rate from NORM samples – A round robin study.*  
**G. De With**

9:50–10:10 *Evaluating the contribution of building manufacts to the indoor radon concentration.*  
**A. Maiorana**

10:10–10:30 *Radon and long-lived decay products in LNG.* **J. Dilling**

10:30–10:35 ERA Presentation. **C. Carpentieri** (ERA vice Chair)

**10:35–11:00 Coffee break**

**Session VI: NORM in the industry and the integrated approach of radioactive and non-radioactive contaminants**

11:00–11:30 **Invited speaker: J. Popic**, *Integrated approach in regulation and management of exposure situations containing NORM and other (non-radioactive) type hazards*

11:30–11:50 *NORM Surveys in O&G Decommissioning Projects.* **P. Varskog**

11:50–12:10 *Holistic approach towards sustainable remediation of contaminated sites: the Grote Nete Valley test study.* **V. Montoya**

12:10–12:30 *Natural radionuclides and heavy metals pollution on sediments from an estuary affected by both mining and industrial activities.* **I. Gutierrez-Alvarez**

12:30–12:50 *Disposal of NORM residues in landfill: a methodology for standardized estimates of compliance to exemption levels in terms of effective dose for individuals of the population.* **F. Trotti**

**12:50–13:50 LUNCH**

**Session VII - Sampling and Characterization**

13:50–14:20 **Invited speaker: P. Cerri**, *Management of technologically enhanced radioactive material (TENORM) in the Oil & Gas companies activities*

14:20–14:40 *Radiological characterization and prospective dose estimate for mining, storing and processing of deep-sea manganese nodules from the Clarion-Clipperton Zone.* **C. Kunze**

14:40–15:00 *Unlocking a Radiological Puzzle: A Comprehensive Approach for the Simultaneous Radiochemical Determination of Radium, Thorium, and Uranium in Solid Matrices.*  
**M. Iammarino**

15:00–15:20 *Challenges in Controlling NORM in Building Materials.*  
**K. Kovler**

15:20–15:40 *Self-absorption correction in gamma-spectrometry Pb-210 measurements in complex NORM samples: experimental and theoretical approaches.* **M. Magnoni**

15:40–16:00 *Optimization of Pb-210 gamma spectrometry determination in NORM – a comparison of the different self-attenuation correction factor approaches.* **T. Doksanská**

**16:00–16:10 Closure and Goodbye coffee break**

## Posters

- 1 *Study and characterization of zeolites for the removal of artificial radionuclides in wastewater samples from nuclear power plants.* **F. Ambrosino**
- 2 *Case study: Assessment of annual effective dose to the population resulting from the disposal of NORM residues exceeding the Clearance Levels and optimization of the measurements requirements.* **G. Bencivenga**
- 3 *Radiological sampling and measurement campaign to improve radiological monitoring of the territory of Kosovo.* **S. Di Pasquale**
- 4 *Valorisation of NORM residues and tailings in line with the principles of Circular Economy: Opportunities and challenges proposed by the IAEA ENVIRONET Working Group #5.* **N.R.E.N. Impens**
- 5 *Development of a process for removal of natural radionuclides and other pollutants in acid waters from phosphogypsum stacks.* **S.M. Pérez-Moreno**
- 6 *Application of INTDOSKIT tool for parameter analysis of dose coefficients for ingestion of uranium at workplaces.* **T. Makumbi**
- 7 *A geological approach as a support for the Italian National Action Plan against radon risk.* **L. Martarelli**
- 8 *Management of industrial situations with residual contamination of Cs-137 from Chernobyl accident.* **M. Frosini**
- 9 *Natural radionuclides in sewage sludge of urban wastewater.* **C. Cantaluppi**
- 10 *Analyses of slag and ash samples performed between 2019 and 2023, with a focus on radioactive equilibrium in natural decay chains.* **L. Dragounová**
- 11 *Implementation of dose calculation methods for NORM by-products in Building Materials in circular economy framework.* **G. Gagliardo**
- 12 *How can RadoNorm contribute to improving NORM regulation.* **W. John**
- 13 *Temporal uncertainty as a key parameter for metrological support of indoor radon measurements.* **K. Kovler**
- 14 *From waste to resource: recycling potential of scale residues from Geoenergy.* **T. Goldberg**
- 15 *Assessment of exposure to radon in the underground tourist route of the Historic Silver Mine - based on two years of research.* **A. Grygier**
- 16 *Uranium, Radium, Lead and Polonium levels in the area of the phosphogypsum basin in South Italy - "Ex Liquichimica" Area.* **M. Taroni**
- 17 *Zircon and Zirconia industry: radiological characterization of the refractory production in Italy.* **R. Ugolini**
- 18 *A protocol to characterise NORM matrices and exposure scenarios in geothermal energy production.* **R. Trevisi**
- 19 *NORMA: a project on radioprotection from NORM by-products reuse in the framework of circular economy.* **G. La Verde**
- 20 *Reuse of sewage sludge containing NORM as agricultural fertilizer: radiological dose assessment for workers and members of the public.* **F. Leonardi**
- 21 *Transport of NORM materials: dose assessments for workers considering realistic scenarios.* **G. Venoso**
- 22 *Environmental Cs-137 accumulation in roof-covering textile: characterization of the contamination and disposal proposal.* **M. Bragato**