



With the participation of



3rd ENA workshop

Istituto Superiore di Sanità
Rome 15-17 May 2024

Scientific Program

Wednesday 15th May

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

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

Chairs: C. Nuccetelli, S. Pepin

- 10:20–10:40 *Critical raw materials; European perspectives and solutions including environmental impact.*
R. Wiegers
- 10:40–11:00 *Bridging barriers to enable recycling of phosphogypsum in alternative cementitious binders.*
W. Schroeyers
- 11:00–11:30 Coffee break**
- 11:30–11:50 *An approach to NORM treatment based on solutions developed for industrial waste.*
B. Michalik
- 11:50–12:10 *Lessons learned from the START houses: A case study in utilizing NORM residues in the circular economy.*
K. Navrátilová Rovenská
- 12:10–12:30 *Concrete Made with NORM-Contained By-Products: Stakeholders' Perception in Three European Countries.*
N. Love
- 12:30–12:50 *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.*
L. Ferrara
- 12:50–13:10 *Radioactivity reduction for NORM Phosphogypsum Byproduct of Phosphate Fertilizer Industry.*
M. Essakhraoui

13:10–14:00 LUNCH

Session II: Regulatory approach

Chairs: B. Okyar, R. Trevisi

- 14:00–14:30 **Invited speaker H. Fonseca**
- 14:30–14:50 *Managing NORM residues: Application of a framework to support the decision-making process.*
N. Impens

14:50–15:10	<i>Gamma radiation emitted by building materials – towards a regulatory framework in France.</i> A. Cordelle
15:10–15:30	<i>Elimination of NORM-waste in Switzerland: A new national directive.</i> R. Stroude
15:30–15:50	Coffee break
15:50–16:10	<i>Should trade unions be concerned about NORM?</i> S. Pepin
16:10–16:30	<i>Does ENA need a Strategic Research Agenda? – Initiative for a dedicated SRA on the research needs in NORM.</i> G. De With
16:30–17:30	ENA General Assembly

Thursday 16th May

SESSION III: European ALARA Network-EAN Session

Chairs: J. Morgan, C. Nuccetelli

9:00–9:25	<i>Optimization of protection. The cornerstone of radiation protection. A view on the NORM industry.</i> F. Vermeersch
9:25–9:50	<i>Overview of the UK regulation on NORM and examples of application.</i> S. Ely
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> R. García-Tenorio
10:15–10:40	<i>Enhancing radiation protection practices: Optimization practices for NORM industries and legacy sites in Greece.</i> C. Potiriadis

10:40–11:05 **Coffee break**

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

12:45–13:30 **LUNCH**

SESSION IV: Young Professionals

Chairs: C. Kunze, L. Van Bochove

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> C. Özcan Kilcan
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Preliminary 3rd ENA workshop Scientific Program

13:50–14:10	<i>NORM Valorization using Oil Shale Ash and Basalt-Boron Fiber in Concrete – an Environmental Life Cycle Assessment.</i> U. Reigo
14:10–14:30	<i>Overview of decommissioning of a NORM legacy site from DCP production. Challenges and lessons learned.</i> M. Płachciak
14:30–14:50	<i>NORM in geothermal installations: Identification of radiological risks, their perception and communication.</i> L. Pollet
14:50–15:15	Coffee 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> G. Ciocari
15:35–15:55	<i>Active measurement of Radon and Thoron indoors and in materials with high resolution alpha spectrometry.</i> M. Javed
15:55–16:05	Young Professional Poster presentations
16:05–16:45	Poster presentations Chairs: M. Magnoni, E. Van Hassel
16:45–19:00	Social program A walk in the centre of Rome, on the <i>Celio</i> (Caelian Hill), close to the Colosseum, among the Roman ruins and the medieval churches.
19:30	Social dinner On the roof of the <i>Hotel Capo D’Africa</i> , close to the Colosseum.

Friday 17th May

SESSION V: Radon and NORM Chairs: F. Leonardi, B. Michalik	
9:00–9:30	Invited speaker: S. Fontani <i>The new National NORM database</i>
9:30–9:50	<i>Measurement of the thoron exhalation rate from NORM samples – A round robin study.</i> G. De With
9:50–10:10	<i>Evaluating the contribution of building manufacts to the indoor radon concentration.</i> A. Maiorana
10:10–10:30	<i>Radon and long-lived decay products in LNG.</i> J. Dilling
10:30–10:35	ERA Presentation. C. Carpentieri (ERA vice Chair)
10:35–11:00	Coffee break
11:00–11:40	Panel Discussion about “radon and NORM in workplaces”

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

Chairs: G. Venoso, R. Wiegers

- 11:40–12:10 **Invited speaker: J. Mrdakovic-Popic**
Integrated approach in regulation and management of exposure situations containing NORM and other (non-radioactive) type hazards
- 12:10–12:30 *NORM Surveys in O&G Decommissioning Projects.*
P. Varskog
- 12:30–12:50 *Holistic approach towards sustainable remediation of contaminated sites: the Grote Nete Valley test study.*
V. Montoya

12:50–13:50 LUNCH

- 13:50–14:10 *Natural radionuclides and heavy metals pollution on sediments from an estuary affected by both mining and industrial activities.*
A. Barba-Lobo
- 14:10–14:30 *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

Session VII: Sampling and Characterization

Chairs: C. Di Carlo, W. Schroeyers

- 14:30–15:00 **Invited speaker: P. Cerri**
Management of technologically enhanced radioactive material (TENORM) in the Oil & Gas companies activities
- 15:00–15:20 *Radiological characterization and prospective dose estimate for mining, storing and processing of deep-sea manganese nodules from the Clarion-Clipperton Zone.*
C. Kunze
- 15:20–15:40 *Unlocking a Radiological Puzzle: A Comprehensive Approach for the Simultaneous Radiochemical Determination of Radium, Thorium, and Uranium in Solid Matrices.*
M. Iammarino
- 15:40–16:00 *Challenges in Controlling NORM in Building Materials.*
K. Kovler
- 16:00–16:20 *Self-absorption correction in gamma-spectrometry Pb-210 measurements in complex NORM samples: experimental and theoretical approaches.*
M. Magnoni
- 16:20–16:40 *Optimization of Pb-210 gamma spectrometry determination in NORM – a comparison of the different self-attenuation correction factor approaches.*
T. Doksanská

16:40–17:00 Closure and Goodbye coffee break

POSTERS

YOUNG PROFESSIONALS

- 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 *Management of industrial situations with residual contamination of Cs-137 from Chernobyl accident.*
M. Frosini
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- 5 *Environmental Cs-137 accumulation in roof-covering textile: characterization of the contamination and disposal proposal.* **M. Bragato**
 - 6 *Natural radionuclides in sewage sludge of urban wastewater.* **C. Cantaluppi**
 - 7 *Analyses of slag and ash samples performed between 2019 and 2023, with a focus on radioactive equilibrium in natural decay chains.* **L. Dragounová**
 - 8 *Implementation of dose calculation methods for NORM by-products in Building Materials in circular economy framework.* **G. Gagliardo**
 - 9 *From waste to resource: recycling potential of scale residues from Geoenergy.* **T. Goldberg**
 - 10 *Assessment of exposure to radon in the underground tourist route of the Historic Silver Mine - based on two years of research.* **A. Grygier**
 - 11 *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. Impens**
 - 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 *NORMA: a project on radioprotection from NORM by-products reuse in the framework of circular economy.*
G. La Verde
 - 15 *Reuse of sewage sludge containing NORM as agricultural fertilizer: radiological dose assessment for workers and members of the public.* **F. Leonardi**
 - 16 *Application of INTDOSKIT tool for parameter analysis of dose coefficients for ingestion of uranium at workplaces.*
T. Makumbi
 - 17 *A geological approach as a support for the Italian National Action Plan against radon risk.* **L. Martarelli**
 - 18 *Development of a process for removal of natural radionuclides and other pollutants in acid waters from phosphogypsum stacks.* **S.M. Pérez-Moreno**
 - 19 *Uranium, Radium, Lead and Polonium levels in the area of the phosphogypsum basin in South Italy - "Ex Liguichimica" Area.* **M. Taroni**
 - 20 *A protocol to characterise NORM matrices and exposure scenarios in geothermal energy production.* **R. Trevisi**
 - 21 *Zircon and Zirconia industry: radiological characterization of the refractory production in Italy.* **R. Ugolini**
 - 22 *Transport of NORM materials: dose assessments for workers considering realistic scenarios.* **G. Venoso**
 - 23 *Decommissioning Challenges and Safety Measures in the NORM Industry.* **W. Zu-Hee**