

## 4<sup>th</sup> ENA Workshop 2026

CENTRO NACIONAL DE ACELERADORES,  
SEVILLA (SPAIN)

March 9<sup>th</sup>-12<sup>th</sup> 2026

**NORM:**  
**Rethink. Reclaim. Revalue**

### WORKSHOP PROGRAM



PROGRAM OVERVIEW			
Monday 09 <sup>th</sup>	Tuesday 10 <sup>th</sup>	Wednesday 11 <sup>th</sup>	Thursday 12 <sup>th</sup>
Registration	Registration	Registration	Field trip Huelva phosphogypsum restoration project
Welcome from ENA and CNA	KEYNOTE SPEAKER 2	KEYNOTE SPEAKER 3	
KEY NOTE SPEAKER 1	Session II: Reclaiming legacy sites	Special Session: Phosphogypsum management	
Session I: Rethinking existing industries and practices			
Lunch break			
Session I: Rethinking existing industries and practices	POSTER SESSION 1	POSTER SESSION 2	
	Session III: Revalue industrial NORM	Special Session: Phosphogypsum management	
PANEL DISCUSSION 1: Valorisation of NORM	ENA Strategic Agenda	PANEL DISCUSSION 3: Scientific, social and regulatory challenges in phosphogypsum re-use	
NIGHT LIGHT SHOW at Real Alcazar	CONFERENCE DINNER	CONFERENCE CLOSURE, YOUNG RESEARCHER AWARD	

## DAY 1: MONDAY 9<sup>th</sup>

TIME	TITLE	AUTHOR
8:45-9:15	<b>WELCOME ENA + CNA: Fidel Grandia (ENA President), Juan Mantero (Local Organising Committee President)</b>	
	<b>Session I: Rethinking existing industries and practices: SESSION IN HONOR OF IVANA ZENATA - Chair: Marta Garcia-Talavera (CSN) - Co-chair: Stéphane Pepin (ENA)</b>	
9:15-10:00	KEYNOTE PRESENTATION: Rethinking NORM waste treatment: Indirect heated vacuum distillation technology for oily NORM sludges	Jan Borbet
10:00-10:20	A practitioner perspective in rethinking radiation protection: the IRPA Task Group on NORM	T. Bituh, A. Canoba, D. Chambers, N. Chambers, M. Chege, A. Cordelle, P. Egidi, A. Ettoufi, R. Gellermann, F. Grandia, J. Hondros, E. Katengeza, C. Kunze, J. Lee, B. Michalik, R. Mishra, K. Navratilova Rovenska, F. Otoo, S. Pepin, Saïdou, R. Sapoi, R. Trevisi, O. van Dongen, C. Wilson
10:20-10:40	Development of a Dose Assessment Model for Incineration of NORM Residues: Worker and Public Exposure Scenarios in Italy	R. Trevisi, P. Cerri, S. Manenti, G. Lepori, V. Venturi, S. Fontani, L. Luzzi, L. Magro, S. Mariani, F. Duchi, G. Venoso, F. Leonardi
10:40-11:10	<b>COFFEE BREAK</b>	
	<b>Session I: Rethinking existing industries and practices - Chair: Wouter Schroeyers (UHasselt) - Co-chair: Rosabianca Trevisi (INAIL)</b>	
11:10-11:30	Study of equilibrium in natural decay series in NORM samples typical for the Czech Republic	T. Doksanská, A. Kelnarová
11:30-11:50	Extreme <sup>226</sup> Ra- <sup>210</sup> Pb- <sup>210</sup> Po activity concentration in scaling from phosphoric acid industry. Clues for the dismantling stage	F. Grandia, M. Płachciak, A. Perri
11:50-12:10	Dose assessment model for workers involved in the construction and demolition of zirconia-based refractory furnaces	F. Leonardi, R. Trevisi, F. Duchi, G. Venoso, G. Pratesi, S. Bucci, I. Peroni, F. Trotti, R. Ugolini
12:10-12:30	Cementitious composites containing tionite as a cement replacement: mechanical, durability and radiological characterization	L. Ferrara, M. Davolio, E. Cuenca, F. Trotti, R. Ugolini, S. Bucci, I. Peroni, F. Duchi, F. Leonardi, R. Trevisi, M. Pugliese, G. La Verde, R. Rusconi, C. Nuccetelli, G. Venoso
12:30-12:50	Beyond the rational, the silica processing and the discharge regulations in Norway	B. Friede, R. Gellermann, K. Flesch
12:50-13:50	<b>LUNCH BREAK</b>	
	<b>Session I: Rethinking existing industries and practices - Chair: Nathalie Impens (SCK-CEN) - Rainer Gellermann (Nuclear Control &amp; Consulting)</b>	
13:50-14:10	Implementation of Specific Clearance in the Netherlands; lessons learned	P. Bekhuis, S. Palstra
14:10-14:30	Natural radionuclides on the plate: <sup>210</sup> Po and <sup>210</sup> Pb from wild food consumption and their relevance for NORM risk assessment	F. Pinero-Garcia, E. Forssell-Aronsson
14:30-14:50	Towards Sustainable Water Management of NORM in Mining and Mineral Processing	N. Gajendra, D. Avsar, M. Pelkonen, R. Grønvold, E. Levei, I. Török, M. Dinis, M. C. Vila, D. Yılmaz, L. Ferrando-Climent
14:50-15:10	Is sustainable and safe the extraction of monazite nodules in Central Spain?	R. García-Tenorio, G. Manjón, I. Vioque
15:10-15:30	Radiometric study of NORM in binary cycle geothermal installations	L. Pollet, W. Schroeyers, M. Hult, M. Vasile, G. Marissens, H. Stroh, S. Schreurs
15:30-15:50	<sup>210</sup> Po accumulation on sulfide scales in geothermal energy installations	V.M. Abecia, S. Salah, M. Vasile, V. Cappuyns
15:50-16:10	Management of NORM wastes in the Czech Republic: regulatory framework and some challenges	I. Zenata, K. Navratilova-Rovenska
16:10-16:30	TBA	Sven van den Berghe
16:30-17:00	<b>COFFEE BREAK</b>	
17:00-18:00	<b>PANEL DISCUSSION 1: Valorisation of NORM</b> <b>Moderator: Rob Wiegers (IBR Consult); Panelists: Gvoert deWith (NRG), Sven van den Berghe (PanTera), Rafael García-Tenorio (CNA), Liberato Ferrara (Politecnico di Milano)</b>	
20:00-22:00	<b>NIGHT LIGHT SHOW at Real Alcazar</b>	

## DAY 2: TUESDAY 10<sup>th</sup>

### Session II: Reclaiming legacy sites - Chair: Fidel Grandia (Amphos 21) - Co-chair: Federica Leonardi (INAIL)

TIME	TITLE	AUTHOR
8:45-9:30	KEYNOTE PRESENTATION: Remediation of legacy sites in Belgium. The case of the rivers Winterbeek and Grote Laak	Boris Dehandschutter
9:30-9:50	Remediation of a legacy mining site in Norway – Søve Mines, Telemark	Edda Bæk
9:50-10:10	Factors affecting mobility of uranium at an alum shale legacy site in Norway	M. K. Pelkonen, E. Reinoso-Maset, G. T.W. Law, O. Ch. Lind, L. Skipperud
10:10-10:30	Factors influencing remediation strategies at a NORM-affected legacy mining site in Norway	D. Jakab, J. Brown, H. Haanes, J. Mrdakovic-Popic
10:30-10:50	Mechanical activation, radiological risk, and sustainable utilization of fly ash	E. Jovan Janusheski, T. Arangelovski, G. Markovski, V. Jovanov, B. Angjusheva
10:50-11:20	<b>COFFEE BREAK</b>	
	<b>Session II: Reclaiming legacy sites - Chair: Lonneke Van Bochove (Straling Support) - Co-chair: Kostantinos Tsirikos (DIDO Shipping Co)</b>	
11:20-11:40	Holistic Approach to NORM Management: Lessons from the IAEA ENVIRONET NORM Project	M. García-Talavera, H. Monken-Fernandes
11:40-12:00	NORM soil profiles from a former coal mine in southern Spain	A.J. López-Fuentes, G. Manjón, E. Chamizo, J. Mantero
12:00-13:00	<b>PANEL DISCUSSION 2: Global Challenges in Offshore Oil &amp; Gas Decommissioning</b> <b>Moderator: Kostantinos Tsirikos (DIDO Shipping Co); Panelists: Oskar Van Dongen (Shell), Lonneke Van Bochove (Straling Support), Lucas de Oliveira (SBM Offshore), TBC ( ClearStream)</b>	
13:00-14:00	<b>LUNCH BREAK</b>	
14:00-14:45	<b>POSTER SESSION 1 - Chair: Govert de With (NRG)</b>	
1	Measurement of natural radionuclides in NORM – inter-comparison exercise in the Czech Republic	T. Doksanská, A. Kelnarová, L. Dragounová
2	Disequilibrium in natural decay series in samples from Czech water treatment plants: uranium, radium and thorium isotopes determination	A. Kelnarová, T. Doksanská
3	iMP: a user-friendly interface for fast model prediction of NOR infiltration and aqueous transport underground	A. Perri, P. Trincherro, F. Grandia
4	Analgesic effect of natural radon spa therapy on musculoskeletal pain: a systematic review	M. Sumitani, T. Kogure, S. Nagata, R. Inoue, Y. Odawara, Y. Yokoshima, M. Sumitani
5	Development of the measurement and assessment of natural radionuclide content in building materials in the Czech Republic since 1997	L. Dragounová, P. Rulík, M. Kořistková
6	Development of Specific Exemption Criteria for K-40	W. Zu-Hee, J. Jung-Hwan
7	Implementation of the Euratom Requirements on Natural Radioactivity in Construction Products: The Spanish Approach	M. Martínez Moreno, R. López Ulloa, M. García-Talavera, I. Simón
8	An Integrated Radiation Protection Approach for the Extractive Industry: A Case Study of Ornamental Granite Quarrying and Processing in Portugal	M. J. Trindade, S. Frazão, M. Reis, M. Malta
9	Analysis of disequilibria in <sup>238</sup> U and <sup>232</sup> Th natural series with RULES	M. Martínez-Rojas, J. Mantero, M. García-León
10	Rapid protocol for the determination of <sup>210</sup> Po in NORM matrices	Y. Pallás-Tamarit, M. Sáez-Muñoz, M. Pérez-Baeza, J. Ordoñez, S. Martorell
11	NORM-related industries: Activities of the Ibero-American Forum of Radiological and Nuclear Regulators	A. Canoba, R. Garcia Tenorio
12	The European ALARA Network: Over Two Decades of Promoting Optimization in NORM Industries	G. Venoso ( <i>on behalf of the EAN steering group</i> )
13	Association of naturally occurring radionuclides and heavy metals to Tajogaite volcano (La Palma, Canary Islands)	M. López, A.M. Gata-Jaramillo, P. Salazar, A. Salas, J. Guillén

**DAY 2: TUESDAY 10<sup>th</sup>**

TIME	TITLE	AUTHOR
	<b>Session III: Revalue industrial NORM: Chair: Alan Tkaczyk (University of Tartu) - Co-chair: Juan Mantero (University of Seville)</b>	
14:45-15:05	Radiological Behaviour of NORM in REE Resources: Ore, Process Streams, and Residue	D. Avsar, D. Yilmaz, M. Pelkonen, N. Gajendra, L. Ferrando-Climent, L. Stavsetra
15:05-15:25	Recovery of Critical Radionuclides for Targeted Alpha Therapy from Industrial and Nuclear Waste Streams	G. de With, T. Tchakoua, P. Haass, H. Meeussen, B. Janssen, S. Brandjes, S. Van der Sar
15:25-15:45	Valorisation of CaF <sub>2</sub> -rich byproducts from a former phosphate industry: characterisation of byproducts and exploratory leaching of U and Ra	D. Schoefs, W. Schroyers, D. Vandamme, F. Grandia
15:45-16:05	Radiological impact study to valorise refractory waste in ceramic products	M. Pérez-Baeza, P. Martorell, M. Sáez-Muñoz, J. Ordoñez, S. Martorell
16:05-16:25	LCA4NORM: A Novel Framework for Integrating Naturally Occurring Radioactive Material (NORM) into Life Cycle Assessment towards a Circular Economy	B. Michalik, L. Ferrara, R.V. Gagliardi, F. Leonardi, J. Mrdakovic Popic, F. Scaini, R. Trevisi, G. Venoso
16:25-16:45	NORMIA digital tool for Life Cycle Impact Assessment of NORM in construction materials	C.Ö. Kilcan, A.H. Tkaczyk
16:45-17:15	<b>COFFEE BREAK</b>	
17:15-18:00	<b>ENA Strategic Agenda (conducted by G. de With)</b>	
20:00-22:00	<b>OFFICIAL CONFERENCE DINNER</b>	

## DAY 3: WEDNESDAY 11<sup>th</sup>

Special Session: Phosphogypsum management - Chair: Vanessa Montoya - Co-chair: Ron Zevenhoven		
TIME	TITLE	AUTHOR
8:45-9:30	KEYNOTE PRESENTATION: Stakeholder perspectives on the management of the Turnu Magurele NORM site in Romania	Catrinel Turcanu
9:30-9:50	Valorization of phosphogypsum in Agriculture: "in medio est virtus"	R. García-Tenorio, J.M. Abril, G. Manjón
9:50-10:10	Recovery of high-quality gypsum and dicalcium phosphate from phosphogypsum	K. Kovler, D. Kosson
10:10-10:30	Radon transport in porous materials; application to the restoration of a phosphogypsum repository	E. Castaño-Casco, I. Gutiérrez-Álvarez, A. Barba-Lobo, J.P. Bolívar
10:30-10:50	Engineering biochar-phosphogypsum composites as sustainable soil amendment for plant growth	D. Almeida, A. Cuyppers, M. Huybrechts, D. Vandamme, S. Schreurs
10:50-11:20	<b>COFFEE BREAK</b>	
Special Session: Phosphogypsum management - Chair: Robbe Geysman (SCK-CEN) - Co-chair: Catrinel Turcanu (SCK-CEN)		
11:20-11:40	Recycling phosphogypsum for the circular economy: tracking radioactive species from the starting material to the final valuable products	A. Pavón-Duarte, A. Romero-García, M. Vasile, N. Impens, L. Esquivias, V. Morales-Flórez
11:40-12:00	Leaching behaviour of phosphorus and Rare Earth Elements from Croatian phosphogypsum for valorisation	M. Zevenhoven, S. Nordgren, D. Schmid, R. Zevenhoven, Ch. Kency, S. Pavon, N. Impens, M. Vasile
12:00-12:20	Radioactive elements in phosphogypsum during chemical conversions	R. Zevenhoven, E. Koivisto, J.-O. Lill, V. Vergara-Urbe, M. Zevenhoven, M. Vasile, N. Impens
12:20-12:40	Valorisation of phosphogypsum leachate decontamination waste as cement replacement in mortars	F. J. Soto-Cruz, J. Rosales, J.P. Bolívar, I. Ramos-Lerate, F. Agrela, M.J. Gázquez
12:40-13:40	<b>LUNCH BREAK</b>	
Special Session: Phosphogypsum management - Chair: Robbe Geysman - Co-chair: Catrinel Turcanu		
13:40-14:00	Development of a process for removal of natural radionuclides and other pollutants from phosphogypsum acid leachates (RADREMOVE project)	J.P. Bolívar, F.J. Soto, S.M. Pérez-Moreno, M. Gázquez
14:00-14:20	Restoration project and environmental radiological monitoring program (ERMP) for the PG stacks located at Huelva (Spain)	F. Mosqueda-Peña
14:20-15:20	<b>POSTER SESSION 2 - Chair: Konstantinos Tsirikos (DIDO Shipping Co)</b>	
1	Establishment of numerical criteria for considering soils as radiologically contaminated. The SUCORA Project	E.T. Mora-Carrillo, A. Rigol, S. Martorell, C. Olondo, J.P. Bolívar and R. García-Tenorio
2	SARNUC, a project for monitoring nuclear facilities, including NORM deposits	F. González, J. Mata, F. Carreño, J.L. Guerrero, E. Giménez, A. Donato
3	Life Cycle Inventories for NORM-Containing Cement-based Construction Materials: A Review of Data Gaps and Radiological Impact Integration	L. Ferrara, E. Cuenca, F. Trotti, R. Ugolini, S. Bucci, I. Peroni, F. Duchi, F. Leonardi, R. Trevisi, M. Pugliese, G. La Verde, R. Rusconi, C. Nuccetelli, G Venoso
4	Adoption of Circular Economy Practices in NORM Management	M. Thiercelin, C.Turcanu, V. Cappuyens, R.Geysmans
5	Study of the effective external dose and exhalation of <sup>222</sup> Rn in building materials formulated from carbonated alkaline waste	A.M. Moreno-Reyes, J.A. Suárez-Navarro, A. Guerrero, M. Frías, V.M. Expósito-Suárez, J.F. Benavente
6	Recycling potential of NORM in Geoenergy	T. Goldberg, N. Klasen, S. Regenspurg, P. Frings
7	Valorization diagnosis of roasted pyrite ashes wastes from the Iberian Pyrite Belt	J. A. Ramírez-Pérez, M. J. Gázquez-González, J. P. Bolívar-Raya
8	Cases of NORM Legacy Sites in South Korea	Zu-Hee
9	Radiological impact assessment in the valorisation of phosphogypsum leachate decontamination wastes	F.J. Soto-Cruz, J.P. Bolívar, I. Ramos-Lerate, M. Casas-Ruiz, M.J. Gázquez
10	Gamma spectrometry assessment of treated phosphogypsum within the framework of Euratom Activity Concentration Index 2013/59	S. Di Pasquale, S. Carta
11	Radiological characterization of European phosphogypsum for sustainable recycling strategies	N. Impens, M. Vasile, V. Morales-Flórez
12	Temporal pollution evolution in sedimentary columns affected by industrial and mining activities	A. Barba-Lobo, M. del Caño-Mármol, E. G. San Miguel, J. L. Guerrero, J. P. Bolívar
13	Influence of phosphogypsum releases on the distribution of natural radionuclides and toxic elements in surface sediments from the Tinto River estuary (SW Spain)	J.L. Guerrero, A. Barba-Lobo, J. P. Bolívar
14	POLYECO commercial services (Only Pitch presentation)	Iason Mitsios
15	Amphos21-RSK commercial services (Only Pitch presentation)	Marcin Plachciak

**DAY 3: WEDNESDAY 11<sup>th</sup>**

<b>TIME</b>	<b>TITLE</b>	<b>AUTHOR</b>
15:20-15:35	LOGISTICS BRIEFING FIELD TRIP (LOC)	
15:35-16:05	COFFEE BREAK	
16:05-17:30	PANEL DISCUSSION 3: Scientific, social and regulatory challenges in phosphogypsum re-use Moderator: Vanessa Montoya (ENA); Panelists: Fernando Mosqueda (NORM Technology Consulting), Ron Zevenhoven (Åbo Akademi University), Marija Djurokovic (Prehnt), Katrijn Vandersteen (FANC), Robbe Geysman (SCK-CEN)	
17:30-18:00	CONFERENCE CLOSURE, YOUNG RESEARCHER AWARD (ENA-CNA)	