

NORM IX

Overarching NORM Issues



NORM IX

Ninth International Symposium
Naturally Occurring Radioactive Material

Summary



- Brief summary of the symposium!
- Intended to be a wider review:
 - Issues from NORM VIII
 - Themes and issues from NORM IX
 - Identify problems and areas for further work
 - Some thoughts to generate discussion...





To the organisers and our hosts:
CRCPD, EPA, US NRC, NCRP
ICRP, UNSCEAR, WHO, ILO, IRPA

Steering Committee, Organizing Committee & Scientific
Programme Committee

& Sponsors

Thank you!

TOPICS: production, classification, worker, radiological, NORM, WASTES, ICRP, EPA, NRC, UNSCEAR, WHO, ILO, IRPA, IAEA

<https://www.crcpd.org/normix>

Join us as an Attendee, Sponsor or Vendor!

More than 200 posters and presentations from over 50 countries

Networking and social events at NORM IX (additional cost applies)

Tour of Red Rocks Amphitheatre
Tour the on-site museum, amphitheatre and visit the gift shop.
There is an on-site restaurant for lunch.

Central City Night Out
Ride into the Rocky Mountains to the historic town of Central City
Enjoy restaurants, gift shops and casinos.

Special Training Sessions:

"Walk to Power" NORM Management Workshop
(20th September 2019)
2019, 20th September 2019
This one-day visit and workshop is designed to help NORM from identification to final disposition will address practical and legal methods in managing NORM conventional operations and more.

Radiation Risk Assessment Training (20th-21st September 2019)
2019, 20th-21st September 2019
This 2-day advanced course focuses on specific technical and regulatory issues that International Project Management (IPM) and On-site Conventions (OSC) address when managing high-level waste in the environment conducted by radioactive waste management.

International Challenges and Solutions Related to NORM Decision and Waste Management, organized by the IAEA UNDOCT (20th-21st September 2019)
2019, 20th-21st September 2019
The IAEA NORM IX NORM Program is focused on providing practical guidance on establishing policies and strategies to deal with NORM waste. NORM waste inventory, production, and development of sites associated with the management practice. Several speakers will be presenting during the friendly afternoon session. Working sessions of the NORM Program will be held on Monday and Friday afternoons and are open to all who wish to attend.

IAEA Workshop on the Safe Management of NORM (20th-21st September 2019)
2019, 20th-21st September 2019
This workshop will provide information on relevant safety standards applicable to industrial activities involving NORM and present key safety issues in terms of policy, regulatory and operational aspects.

CRCPD Workshop: Radiation Protection in NORM Industries (20th-21st September 2019)
2019, 20th-21st September 2019
The CRCPD will deliver national and international organizations to study areas of focus related to the handling and disposal of NORM generated during site, industrial processes. Critical elements that can be taken to improve practices and standards of the public.

IAEA, ICRP, UNSCEAR, WHO, ILO, IRPA, EPA, NRC, USNRC logos

Themes from NORM VIII

- Requirements for NORM clearer but still need for further clarification and guidance on practical application with case studies
- Regulator is driving the system, but much more industry input is needed
- Need to work more closely with industry to inform them about international guidance but also to produce industry oriented guidance.
- Measurement is all very well, but need to concentrate on how to assess and interpretation
- Efforts to communicate with members of the public have not always been successful, resulting in ongoing misconceptions. This is a very challenging task, but there were indications that such efforts could (and should) be made to work.

Continued desire for harmonisation



- Radon reference levels
- Dose Conversion factors
- Regulatory limits e.g. products and disposal
 - USA; where there have been many barriers to harmonisation even within the same country
- Inconsistency does not give the public confidence in the science

The system of protection



- Radiological Protection from Naturally Occurring Radioactive Material (NORM) in Industrial Processes
- ICRP system of exposure categories (planned/existing) for NORM may be problematic for industry because NORM is not introduced into these processes because of its radiation content.
- Need to be aware socioeconomic issues vary in importance between countries

Models and measurements



- Need to be sensible in approach
- Measurements continue to be important
 - Understand limitations of measurements in different situations
- Developments in instrumentation
- In both cases, need to recognise
 - Purpose
 - Limitations
 - Uncertainties (statistics, etc).

Radon & Thoron



- Radon exposure continues to be an issue
- ICRP Pub 137 recommends new dose coefficients, from 2x to 3x compared to previous recommendations for workers, depending on breathing rate
- IAEA organizing Technical Meeting next week in Vienna on implications of the new Rn dose coefficient
- Inconsistency in ICRP and UNSCEAR recommendations will create a significant challenge; **a single value is critical**
- ICRP's new value will result in an **economic impact on industry**, requiring additional mitigation activities in many workplaces
- The recommendation for a new value will be **difficult to explain to industry**; this could lead to a **loss of trust** and reluctance to comply with new monitoring or mitigation requirements
- What is the degree of certainty regarding the new value? Have all relevant data sets been considered?

Management of NORM residues - phosphogypsum



- Increasingly recognised as a resource
- Reuse of phosphogypsum (PG) in construction material will help to preserve primary raw materials and reduce current PG inventory – by 2025 there will be 7 to 8 billion tons for stored PG - current recycling rate is only about 5%
- Chemical contamination and radiological risk to human health are main concerns
- Dangers and costs of managing PG stacks long term, e.g. sink hole in Florida, recent flooding of 1.5 million tons of acidic PG slurry in the national park in Israel
- Problems of customer acceptability, concerns about any future liabilities and will always be cheaper to use virgin materials
- An impediment to beneficial alternative uses of PG is the lack of harmonization of regulatory goals governing the use of PG, however before harmonizing the standards, it is important to strengthen the policies and measures to enforce reuse and recycling on NORM residues in general

Transport



- IAEA needs greater involvement of industry bodies and key companies – regulators should talk to industry to find out what is happening
- Make sure that companies are not disadvantaged by complying with the regulations
- Use safety controls as way of monitoring compliance – will require training of border officers – could this work?
- Some progress on issues raised at NORM VIII but IAEA working on development of Safety Report to provide guidance on NORM

Real life challenges and solutions



- Many examples given including
 - Radium removal from formation water from coal mines
 - Disposal of NORM from geothermal energy production
 - Investigation of treatment of NORM in drinking water
 - Bioremediation efforts using plants to uptake metals
 - Using Alkali-activated binder to improve the performance of PG use in cement
 - Use of slurry fracture injection technology for NORM waste disposal

Issues

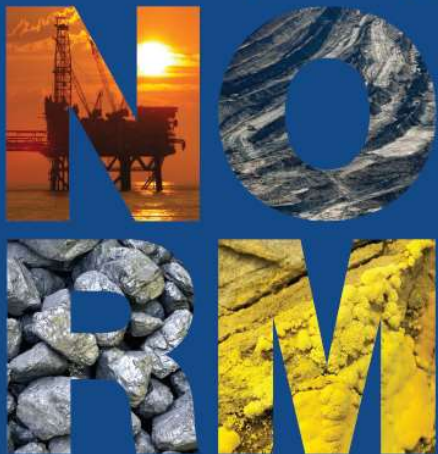
- Ownership and Financial Assurance
- Planning for continued monitoring of sites




Ongoing work of IAEA

- Regional / national projects on NORM; Regional workshops, Fellowship, scientific visits
- Development of safety guides and reports
- ENVIRONET
- ORPAS
- Information exchange platforms e.g NORMEX/ORPNET

International Conference on
**Management of Naturally
Occurring Radioactive
Material (NORM) in Industry**



**19–23 October 2020
Vienna, Austria**



IAEA
International Atomic Energy Agency

#NORM2020

CS-0001

19-23 October 2020
www.iaea.org/events/norm-2020

Abstracts and participation forms due
28 February 2020

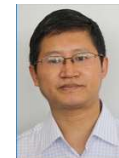
**IAEA Scientific
Secretaries**



Horst Monken-
Fernandes
NEFW



Burcin Okyar
NSRW



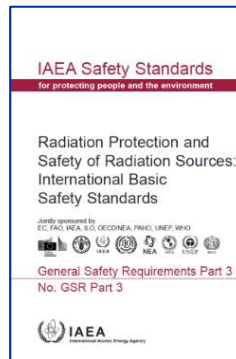
Zhiwen Fan
NSRW

International Conference on Radiation Safety

When?

9-13 November 2020

For whom?
regulators, operators,
radiation protection
professionals, young
scientists



Topics

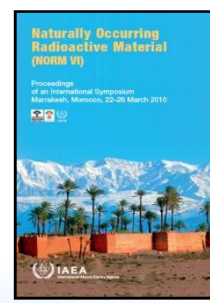
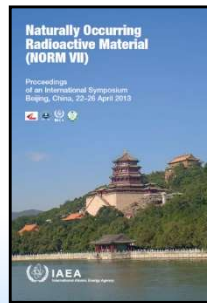
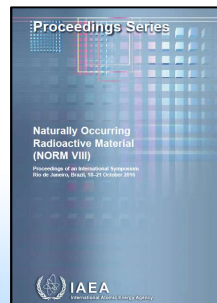
- Challenges with the SRP
- Dose constraints, reference levels, dose limits
- Optimization
- Existing exposure situations
- Dose limit for the lens of the eye
- Implementation challenges
- Radon
- Food and drinking water
- Industrial operations involving NORM
- Aircrew and space crew
- Non-medical human imaging
- Justification of medical exposures
- And others...



- All NORM IX presentations will be available at ORPNET <https://nucleus.iaea.org/sites/orpnet/home/SitePages/Home.aspx>



- NORM IX proceedings ; Deadline for full paper submission is end of November 2019



Thank you!

