RADIATION PROTECTION IN INDUSTRIES WITH NORM IN GHANA - EXPERIENCES AND CHALLENGES

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Active member: NORM TG

TG was set up by IRPA (6 Researchers, 6 Regulators and Authority, 6 Consultants, 1 Experts from industry with Jim Hondros and Rainer Gellermann as Co-Chairmen)

Excellent opportunity for practitioners around the world to make new networks and relationships.

Countries developing their systems like Ghana – they can see what has worked elsewhere and what has not worked

The network allows us to work together, to solve problems in a very practical way

This occurs by sharing methods and techniques and also assistance with problem solving.

With some aims as to develop a common understanding, good practice and provide practical solution for challenges faced by industry practitioners and regulatory bodies etc.
Ghana is a sovereign state located on the Gulf of Guinea and bounded to the south by the Atlantic Ocean, to the east by the Republic of Togo, to the North by the Burkina Faso and to the west by Cote d’Ivoire.

- It has a population of about 31 million according to recent estimates by the UNDP.

- 51% & 49% are females and males respectively.

- It has two main seasons; dry (October to March) and rainy seasons (April to September).
Introduction

1. Burkina Faso
2. Benin
3. Togo
4. Ghana
5. Ivory Coast
6. Liberia
7. Sierra Leone
8. Guinea
9. Guinea-Bissau
10. Senegal

WorldAtlas
Introduction

❖ Naturally occurring radioactive materials such as uranium, thorium and potassium, and their decay products, such as radium and radon are found in the raw or processed materials.

❖ Industrial process of these raw materials into gold, copper, aluminum, phosphate, uranium, iron and oil and gas etc., can lead to increase in the residues or waste product with enhanced level of NORM.

❖ Mining and mineral processing are the main industries in Ghana associated with enhanced levels of Naturally Occurring Radioactive Materials (NORM).

❖ Activities in these areas have been carried out for quite number of years with very little knowledge about the potential radiological hazards.

❖ The RPI/GAEC with support of International Atomic Energy Agency (IAEA) started NORM monitoring in early 2000s in mining and other workplaces.
Ghana has about 200 mining companies (small, medium to large scale) in both underground & surface operations.

In 2010, Ghana began production of oil in commercial quantities.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Type of Industries</th>
<th>Problem Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining &amp; processing</td>
<td>Gold</td>
<td>Radon, dust inhalation, tailings</td>
</tr>
<tr>
<td>Exploration &amp; production</td>
<td>Oil &amp; gas</td>
<td>Radium-226 containing scales &amp; sludges (waste), Radon-222</td>
</tr>
<tr>
<td>Other extractive industries</td>
<td>Quarry, etc.</td>
<td>Dust inhalation, radon</td>
</tr>
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</table>
❖ The effective radiation protection programme for control of NORM started with the promulgation of Legislative Instrument (LI) 1559 in 1993.

❖ The Radiation Protection Institute (RPI) was established as technical support for Radiation Protection Board (RPB) for the implementation of LI 1559.

❖ In 2015, independent Nuclear Regulatory Authority (NRA) Act 895, 2015 was established.

❖ NRA act makes a provision for safe transport, management of NORM residues and monitoring of occupational exposed workers in the NORM industries.

❖ Currently, Ghana does not have national guidelines for NORM levels workplaces, however, the international references levels and limits outlined in the IAEA GSR Part 3 and other international occupational and environmental safety guidelines has been adopted.
Ghana has a well-established environmental and occupational monitoring laboratories to deal with NORM management issues:

- Secondary Standards Dosimetry Personal Dosimetry,
- Gamma-spectrometry,
- Alpha and Radon laboratories.
Laboratory Infrastructure for NORM/Radon Analysis
On-going NORM measurement in workplaces

Cr-39

Thoron progeny monitors

AlphaGuard
Environmental Management of NORM

NORM transport Safety and waste storage facilities

- Oil and Gas Waste Management System currently available in Ghana
- Excludes major NORM related issues
- But approved Oil Waste Management Companies (2) are in the process of;
  - building capacity to handle, store and dispose NORM waste such as Scale, sludge and produce water.
Challenges and Recommendations 1/2

- Difficulty in resourcing and requisite personnel to work in operations and regulation of NORM
  - To develop the next generation of radiation protection practitioners
  - Involvement in education and talking about what we do
  - By providing work experience for students and also research topics for their studies
  - This encourages younger people to want to work in this area.

- The regulatory framework established but regulation and guidelines are yet to be promulgated for disposal, storage and transport of NORM.
  - Encourage regulatory authority to establish regulations and guidelines in line with the BSS and other international standards.
  - Should be encourage seminars and workshops between politicians, policy makers, regulatory authority and appropriate institution to facilitate the approval of the regulations
Challenges and Recommendations 2/2

- Inadequate knowledge on acceptable radioactivity levels and radiological effects on exposure to NORM waste and radon in workplaces among populace.
  - Awareness training on NORM targeting policy makers, regulators, practitioners, researchers, stakeholders, etc.

- Insufficient resources for regulatory bodies to carry out inspection and enforcement.
  - Well resource regulatory authority will perform its work independently.

- Lack of appropriate radiation protection programmes for specific NORM practices.

- Inadequate infrastructures for the management of NORM issues and radon in workplaces.
Ghana has adopted GSR Part 3 and other international occupational safety documents to protection of workers, public and environment against any enhanced level of NORM due to activities of industries.

Radiation protection infrastructure for industries with NORM has been established. It includes a new independent regulatory authority, environmental radioactivity monitoring equipment, and two storage NORM waste facilities.

Even though the regulations and guides are yet to be approved by the appropriate government authority, Ghana is proactively working in this important area.
Welcome to AFRIRPA 06
6th African IRPA Congress

Theme: Embracing Radiation Protection Education and Safety Culture
Accra - Ghana

◆ www.afrirpa06.org
ACKNOWLEDGEMENTS

Grant support to attendance symposia

Provide information on their laboratory equipment

IRPA NORM Task Group: providing expertise on developing radiation protection infrastructure for NORM.

Organizing this symposia for sharing expertise

Thank You